PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS OF THE DRINKING WATER QUALITY AND EPIDEMIOLOGICAL STUDY OF DISTRICT NEELUM

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Submitted in partial fulfillment of the requirements for the

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IN THE NAME OF ALLAH, THE MOST MERCIFUL AND BENEFICIENT

Dedicated To my loving

Parents, Brother, Respected Teachers & Friends

Title of Thesis: Physico-chemical and Microbiological Analysis of the Drinking Water Quality and Epidemiological Study of District Neelum

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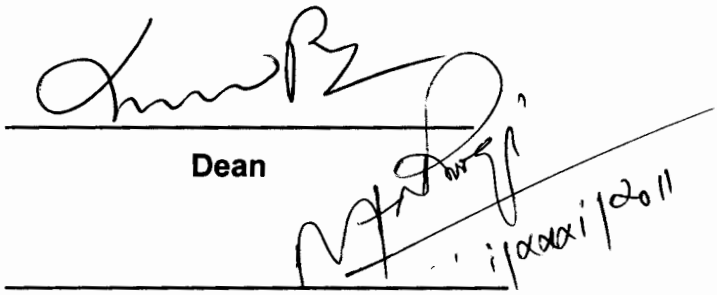

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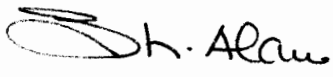

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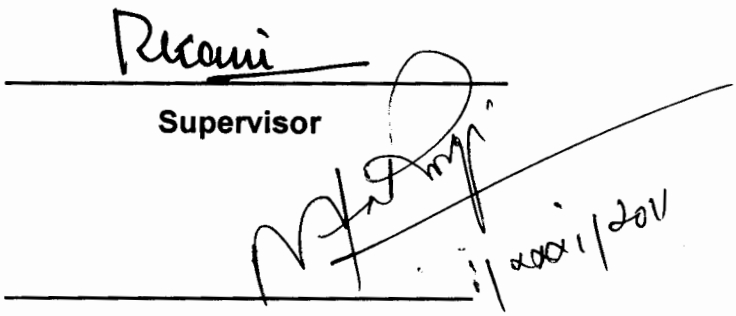

Supervisor

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ABSTRACT

Quality of water is vital for sustaining healthy life and associated activities. More than a billion people in the developing world including Pakistan lack safe drinking water, an amenity those in the developed world take for granted. Nearly three billion people live without access to adequate sanitation systems necessary for reducing exposure to water-related diseases. The calamity of the October 2005, earthquake tore apart the whole area of Kashmir including Dist Neelum. In this situation, not only water sources but water distribution systems were also damaged badly. So, a comprehensive study was designed to investigate the current condition of freshwater; at sources (springs), condition of existing water sources & its management and the disease produce from the use of these source water.

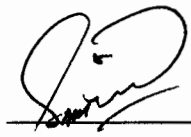
In district Neelum, a total of 64 water samples were collected from 5 Union councils (UCs). Water samples were analyzed for 7 different Physico-chemical and microbiological parameters. Results revealed that; Out of 64 water samples, only 03 samples were having high turbidity levels than permissible limits of WHO. Scheme no(s); 16(9.3) 27(5.81) in UC Bharian and 53 (6.34) UC Shah Kot. All water samples showed presence of microbial contamination in the form of total coliform and while in 52 out of 64 water samples *E. coli was investigated.* Nearly all of the WSS's were not in good conditions, among the 64 WSS's 11 have found to be developed spring boxes, *Only one infiltration gallery* was developed , one WSS was fenced, 07 WSS's were found that were protected from flood diversion *channels and only 12 WSS's have no* stagnant water around the sources. However, water sources at their sites were having input of microbiological contaminants from adjacent areas or due to humans' and animals' activities which causing severs health problems.

A questionnaire survey about water born diseases was conducting from five UC and capital city of district Neelum. The results indicated that people of all age of distt Neelum were affected by water born diseases and infections e.g. Diarrhoea and Dysentery 22.7%, Cholera (Heza) 12.2%,Typhoid 4%, Skin Infection 9.2%, Eyes Infection 9.2%, Hepatitis 2.3%, Intestinal Worms 7.82%, GIT Infection 7%, Kidney Infection 3.67% and Fever 14.33%.

Considering the overall results of the present study, it can be concluded that water supply schemes of the district Neelum, were not responsible for any significant Physico-chemical contamination in water from sources. The presence of microbial contamination in water sources is the evidence of diseases and infection that were found in residents of distract Neelum.

DECLARATION

I **Mr. Sadiqullah Khan** S/o **Sar Anjam Khan,** Reg# **19-FBAS/MSES/S08**, a student of MS Environmental Science at the Department of Environmental Science, Faculty of Basic & Applied Sciences, International Islamic University Islamabad (IIUI), do hereby solemnly declare that the thesis entitled ***"Physico-Chemical and Microbiological Analysis of the Drinking Water Quality and Epidemiological Study of District Neelum"*** submitted by me in partial fulfillment of the requirements for the degree of MS, if my original work, and has not been submitted or published earlier and shall not, in future, be submitted by me for obtaining any degree from this or any other University or Institution.

Signature: 

Name: Sadiqullah Khan

3rd February, 2011

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All praises to **ALLAH,** the most Merciful, Kind and Beneficent, and source of all Knowledge, Wisdom within and beyond our comprehension. He is the only God who can help us in every field of life. All respect and possible tributes goes to our **HOLY PROPHET MOHAMMAD (SAW)**, who is forever guidance and knowledge for all Human beings on this earth.

I am very thankful to **Dr. Muhammad Irfan Khan** Chairman Department of Environmental Science, for the approval of my research thesis. I am very grateful to my research supervisor **Dr. Rashid Karim**, Associate Professor, Department of Environmental Science, International Islamic University Islamabad, for giving me proper time, suggestions, valuable advises and specially the supportive attitude which was always a source of motivation for me. He guided me in polite and cooperative manner at every step of my research work. I am also very thankful to **Dr. Naeem Ali** Assistant Professor, Department of Microbiology, Quaid-e-Azam University Islamabad who assists me in designing the study.

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Sadiqullah Khan

FORWARDING SHEET

The thesis entitled "A Physico-chemical and Microbiological Study on the Drinking Water Quality from Source and its Impact on Human Health of District Neelum", submitted by Sadiqullah Khan, in partial fulfillment of MS Degree in Environmental Science has been completed under my guidance and supervision. I am satisfied with quality of student's research work and allow him to submit this thesis for further process of as per IIU rules & regulations.

Dated:

Signature: _____

Name: Dr Rashid Karim

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List of Abbreviations

AD	Acute Diarrhoea
AJ&K	Azad Jammu and Kashmir
AJS	Acute Jaundice Syndrome
BD	Bloody Diarrhoea
CBO	Community Based Organization
Chl	Cholera
conc	Concentration
Diarr & Dysent	Diarrhoea and dysentery
Dist	District
E.C	Electric Conductivity
GIT	Gastro Intestinal Track
Hep	Hepatitis
Inf	Infection
INJ	Injuries
LRTI	Lower Respiratory Track Infection
MAL	Malaria
mg	Milligram
Min	Minimum
MS	Measles
MZD	Muzarffarabad
NTC	Not to be count,
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
^{o}C	centigrade
OTH	Others
pH	Potential of Hydrogen
Prof	Performa
PSQCA	Pakistan Standards and Quality Control Authority
Rep	Repeated
SCB	Scabies
Sec	Second

STD	Standard
TDS	Total Dissolved Solid
Typh	Typhoid,
UC	Union Council
UF	Unexplained Fever
UTRI	Upper Respiratory Track Infection
WHO	World Health Organization
WMC	Water maintenance committee
WSS	Water Supply Scheme
+ve	Positive
-ve	Negative
µ/S	Micro Siemen

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Chapter 1

Introduction

1.1 Importance

In Islam, all water is sanctified and sent as a gift from Allah. This is repeated several times in the Holy Qur'an: Allah says,

Have you seen the water which you drink? (Al-Waqia; 68) "

All living things have need of water for their endurance and for the continuation of their lives. Owing this significance of water as the origin of life, Allah has made its use the common right of all creatures. Allah has called to man to be grateful for the worth of this so indispensable source of life. All water can be used for ablution, as long as it is mutlaq (free from dirtiness). Excessiveness in using water in Islam is prohibited. The Prophet (Salallah alihe waalehi wasalam) to his escorts who was washing for prayer said, "What is this wastage, O Sa'd?"

Narrated Abu Huraira (R.A): The Prophet (Salallah alihe waalehi wasalam) said, "The man with whom Allah will neither talk to, nor look at, on the Day of revivification. A man who with-holds his additional water. Allah will say to him, "Today I will with-hold My Elegance from you as you with-held the superfluity of what you had not created."

All living organism necessitate water for their survival and it is a most essential life supporting drink for human. The water which can be used without threat of immediate or long term harm is called drinking water or potable water. Humans have insufficient access to drinking water through out the world and consume contaminated sources of water which have objectionable level of dissolved chemicals and a huge mount of pathogens, which can be lead to widespread acute and persistent disease and is a major cause of death. Mostly the disease-causing organisms transmitted through drinking water from fecal source (Nicholas John Ashbolt).

In the developing world about 400 children below age of 5 die per hour from waterborne diarrhoeal disease. Improved longevity, reduced infant mortality, health, productivity, and material well-being are in general known as fruits of development. As weigh against of industrial and developed countries the developing country populations are commonly having meager position on these indices (Ashok Gadgil, 1998).

Over large parts of the world, the most common contamination of raw water sources is due to anthropogenic activities, which are usually of two categories: chemical/physical and microbiological. Chemicals/physical contaminants are heavy metals, trace organic compound, total suspended solids while Coliform bacteria, *E.Coli* and some other species of bacteria and viruses are Microbiological parameters. Some of the disturbances happen in study area in Neelum Valley are the anthropogenic and natural. Anthropogenic disturbances are water extraction for irrigation, washing activities, toilet use, waste and rubbish input, sewage inflow, picnic, animals, deforestation etc while natural disturbances are droughts, floods, snow melting, erosion, land slides and earthquake etc (Bright Habermann and Markus, 2000).

Access to protected and safe drinking water is indicated by the number of people using appropriate hygienic sources. These improved drinking water sources have household links, public standpipe, borehole condition, protected dug well, protected spring, and rain water collection.

This assessment expected at indicating the impact of intense anthropogenic use of water quality in a densely populated mountainous area in the Neelum district region. The importance of such investigations is documented through the fact that a massive of the population utilizing drinking water from unprotected springs. Water for house hold is therefore often heavily contaminated and causes chronic and severe infections especially in summertime.

To examine the water quality with reference to physico-chemical and micro biological parameters in order to find out; Quality of water at sources and Possible impacts of different parameters on sources of fresh water quality sources. Also to investigate the

impact of water quality on human health of study area

Kashmir, situated in South Asia, is divided between India and Pakistan. The area of Kashmir under the administrative control of Pakistan is called AJ&K .The study area is about 200 kilometers in length to the north and northeast of Muzarffarabad beside the river Neelum, runs parallel to the Khaghan Valley. The valley altitude varies form 1000 m at Thitwal to over 5000 m at Chatthewala. This area was badly affected by the 2005 earthquake and was cut off from the outside world as the roads and paths were filled with rubble. In 1998 the population of Neelum valley was 0.126 Million which increased 0.159 Million till 2006

There is no well structured water supply on a large scale, there is there any sewage treatment or controlled sewage discarding. Throughout of the Neelum Valley there are numerous springs. These could be utilized for water supply for the surrounding settlement, if organized in co-operation with local population. The intention of this study was also to locate appropriate springs, which could be protected and safely used for water supply in future.

The sites were selected with regard to anthropogenic use, and surrounding area to settlement. Another important criterion was to find representative sites of different altitudes (from different union councils of Neelum valley). The variability of springs in the different parts of the district was investigated and suggestion for further water management was developed.

1.2 The Study Area

Kashmir, situated in South Asia, is divided between India and Pakistan. The area of Kashmir under the administrative control of Pakistan is called AJ&K while the rest is occupied by India and is called Indian Occupied Kashmir. It is further divided into eight districts i.e. Muzaffarabad (Capital), Neelum, Bagh, Poonch, Mirpur, Sudhna, Kotli and Bhimber.

1.2.1 Geography

The study area is about 200 kilometers in length to the north and northeast of Muzaffarabad beside the river Neelum, runs parallel to the Khaghan Valley. There are two entrances for Neelum valley, one Neelum Road by Muzaffarabad and the other by Kaghan the Julkhad Road. Usually Neelum valley starts just after Muzarffarabad, It is a valley of fountains, springs, waterfalls, flowering & fruity trees and plants. Geographically too, it is a charitable valley. The Neelum Valley, bow-shaped with majestic pine, fir and deodar trees, lies north-south of Muzaffarabad (capital of AJ&K).This 200 km lengthy kingdom of vegetation is ripped apart by the indigo blue Neelum River which flows meandering down hills to amalgamate itself into the river Jhelum at Domail.

Along Neelum river there is generally fertile and the hillside used to be heavily forested, but increased settlement and deforestation during the last decades have lead to severe alterations in landscape and land use. In Neelum valley the conditions is alike, although within the valley altitude varies form 1000 m at Thitwal to over 5000 m at Chatthewala (Rashid et al, 1996).

This area was badly affected by the 2005 earthquake and was cut off from the outside world as the roads and paths were filled with rubble. Earthquake occurs at regular intervals at this region up till now.

1.2.2 Climate

Traveling during May to October from the burning heat of plains to the high land basin of Neelum Valley is definitely an escape from hell inferno to the cold zephyr of paradise. During the summer the temperature remains in between 65°F to 90° F. Generally the first snow fall receives in the upper region of the area in the month of October and at some times even during September. Normally the tourist season remains from May – October in Neelum valley.

1.2.3 Population and Development

Pakistan is the one of the fastest promising countries in the world. Estimation of developmental organizations reached up to a population of 130 million people in the mid-90ies but now it reached nearly 180 Millions. One woman in Pakistan gives birth to 6 children on average. Particularly in pastoral areas this trend was still unchanged up till now (Bright Habermann and Markus, 2000).In 1998 the population of Neelum valley was 0.126 Million which increased to 0.159 Million till 2006 (Atiq-ur-Rehman et al, 2008).

Table 1.1: The population Growth in the study area from1998-2006

	1998	2006	Population Growth (Annually)
Azad Jammu and Kashmir	2.973 Million	3.596 Million	2.2%
District Neelum	0.126 Million	0.159 Million	2.6%

1.2.4 Land Use and Agriculture

The plain land is usually under irrigation. Irrigation is usually carried out with canals which come from either Neelum river or from springs. In the mountainous region an additional constriction is the lake of irrigation facilities. Here most of the land is only rainfed and is permitted only a limited variety of agricultural product. Fodder production plays a vital and key role for the farmers in the hilly areas, as livestock is essential for their endurance. The Kharif-fodder is almost completely maize in Neelum valley, while Rabi-fodder is Shaftal, barley, ray and others.

4.1.5 Catchment Area

The symphony of surface water depends mostly on natural preconditions in the drainage basin, such as geology, topography, hydrology, etc. In Neelum valley there is strong seasonal dissimilarities in run-off volumes and water level both of Neelum River

and springs. During the rainy season and in summer time during monsoon rain the river exhibit maximum flow. From May to September a high rate of snow melt coming from the upper areas of Neelum valley contribute in addition to a high flow. In the dry of month of winter there is very low flow. Many smaller springs and streams dry out completely or partially during this time of year.

1.3 Aims and Objectives

To estimate the overall quality (Physico-chemical) of different water sources in order to understand the pollution load.

To investigate the water quality with reference to Physico-chemical and micro biological parameters in order to find out;

- Quality of water at sources
- Possible impacts of different parameters on sources of fresh water quality sources
- The physical existence and conditions of water sources
- To investigate the impact of water quality on human health
- Types of infections with reference to water experience by local people in past one year

1.4 Significance of the Research Work

In hilly areas of Pakistan i.e. Northern belt and in AJ&K, most of the water supplies are natural streams. Due to October 2005, Earthquake, some of these streams were also affected, some streams became damaged while some new ones were formed. The main sources of water supply schemes in AJ&K and in district Neelum are unfortunately not protected. As there is no proper Industrial zones in these areas, so there is less problem of COD. However, women wash their clothes at the source or nullah, animals' fetch their thirst and kids take bath. Moreover, these water sources are places of

disposal of sewages from associated population. Consequently, all these contamination from different sources goes directly to the consumer end through pipelines and waterways resulting in different types of diseases like dysentery, diarrhoea, cholera, hepatitis, eyes infection, hepatitis, high blood pressure, kidney stones in locals

Chapter 2

Literature Review

A literature review is the effective evaluation of selected documents on a research topic. The literature review is a critical synthesis of previous research and explains or briefly describes the work that has been reported on a topic or field. The evaluation of the literature leads logically to the research question. The purpose of a review is to analyze critically a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles. The literature review provides a background to the study on "*A PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS OF THE DRINKING WATER QUALITY AND EPIDEMIOLOGICAL STUDY OF DISTRICT NEELUM*" The background may consider one or more aspects.

"We provided you with sweet water (Al-Mursalath: 27)".

He has reminded us, "Say: have you considered, if your water were one morning to have seeped away, who than could bring you clear-flowing water (Al-Mulk: 30)".

Through out the world water is present in huge amount and it is the most essential life supporting substance. Nearly 70% of the earth surface is covered with water and 97.5% of the total water is oceans which are salty and not fit for drinking purposes. 2.5 % of remaining water is fresh water. Less than 1% of total fresh water is useable. If proper methods are used to get fresh water and properly used, then it is enough for the whole population of the world. However with respect to population the fresh water is not equally distributed. About 60% of the world population living in Asia but the continent has access to only 36% of the world water resources. In 2004, 1.1 billion populations of the world have no access to safe drinking water sources and 2.6 billion population of the world have lake access to improved sanitation which represents 17 percent and 42 percent of the world's population respectively (Kahlown et al., 2008).

Drinking water has acceptable quality in term of its physical, chemical and bacteriological parameters so that it can be used without short or long term harmful

effects (Ashok Gadgil, 1998). Water is an important, basic and life-sustaining drink on earth. In developing countries people have too little access to clean drinking water, therefore they mainly use unsafe and unhygienic sources of water which are contaminated by pathogens and dissolved chemicals. Usage of such water for drinking leads to widespread of persistent disease in people (Javaid et al., 2008). The major cause of natural water sources contamination, mostly streams and rivers is domestic, industrial and commercial waste. A huge amount of polluted water is returned to natural sources of water from the surrounding area and makes it hazardous as it carries pathogenic organisms and toxic chemicals (White et al., 2003).

Water is the second most important substance for human being after the air we breathe. About two thirds of human body restrains water by weight. Different organs of the human body contain water in enormous quantity, e.g. the brain contains 95% water, and blood contains 82% water while lungs contain 90% water (Fine waters 2006). Water plays an important and key role in the prevention of disease, for regulating the body temperature water act as a medium (Kahlown et al., 2008).

The 21st century will open with one of the most essential conditions of human development unmet: universal access to basic water services. More than a billion people in the developing world be deficient in safe drinking water that those in the developed world take for granted. Nearly three billion people live without access to adequate sanitation systems necessary to diminish exposure to water-related diseases. The failure of the international aid community, nations and local organizations to assure these essential human requirements has led to substantial, unnecessary and preventable human suffering. An estimated 14-30 thousand people, mostly young children and the elderly, die every day from water-related infections. At any given moment, approximately one-half of the people in the developing world experience from disease caused by drinking contaminated water or eating contaminated food (Gleick., 1999).

There was a very minute concept of the relationship between drinking water and disease at the mid-19th century. Firstly an outbreak of cholera connected to drinking water drawn from unhygienic sources in London by Dr. John Snow, a British physician.

Later on in 19 century Pasteur's discovery of the germ theory, explain how water sometimes causes infections and disease in people. During most of the 20th century microbiological organisms would remain the focus of great concern (Afzal et al., 2006). Microbial pathogenic parameters are usually of greatest concern because of their immediate health risk. Disease-causing organisms (pathogens) known as enteric pathogens because these microbes commonly of fecal derivation and transmit through drinking water (Hunter et al., 2002). Since the pioneering epidemiology in the 1850's, whereby the English physician John Snow recognized that cholera was waterborne. It helps and confirmed that the water can cause the diseases in human beings (Paneth et al., 1998). It was observed that diarrhoea and other diseases in humans caused by various pathogens which are transmitted in the course of potable water (Hunter et al., 2002).In the feces of all warm-blooded animals and some reptiles, common fecal indicator bacterium Escherichia coli (E. coli), is responsible for cholera (Vibrio cholerae) and typhoid fevers (Salmonella typhi and S. paratyphi), these bacterial species are considered necessary to isolated from drinking water by treatment (traditionally by filtration and chlorination (Enriquez et al., 2001).

Approximately 1.1 billion populations in the world were estimated by The World Health Organization (WHO) that used to drink unhygienic and unsafe potable water (Kindhauser, 2003). Due to drinking unsafe water, sanitation and unhygienic conditions are the foremost reasons of diarrhoeal disease (88%) in the world (WHO, 2003). Unsafe and hazardous water, poor sanitation and unhygienic conditions caused approximately 3.1% of annual deaths (1.7 million) and 3.7% (54.2 million) of the annual health encumber worldwide (Ashbolt, 2004).

About 52 nations are expected that will be facing a severe deficiency of potable water, including half the world's population till 2025. In the next 25 years, water scarcity will be facing by about 3 billions peoples. Similarly, in these circumstances the major issues and problems of South Asia include unavailability of fresh, inadequate access to potable and fresh water, water born disease, arsenic contamination of drinking water, seasonal limitation of availability of natural resource, depletion of fresh water aquifers and organic pollution (Kahlown et al., 2008).

The mainly and common health risk, associated with drinking water is Biological contamination (Bryan et al., 2002). Water is ideal and perfect for drinking which shouldn't contain any microbes or pathogens (Prasai et al., 2007). Mostly pathogens are transmitted by means of drinking water and cause diseases in human beings (Ashbolt, 2004), the drinkable water polluted with organic wastes, which provide food for bacteria (White et al., 2003). In human beings the risk of water-born infections and disease like typhoid fever, shigellosis, diarrhea, cholera, and dysentery increases with pathogenic contamination of drinking water (WHO, 2006). About 1.1 billion people globally drink unsafe water and the gigantic preponderance of diarrhoeal disease (88%) in the world are attributing to microbial contaminated water. Approximately 2.2 million annual deaths world wide are also attributed due to hazardous drinking water (Clasen and Bastable, 2003; Ashbolt, 2004).

As a scientific discipline, water virology was born after a bulky hepatitis outbreak was confirmed in New Delhi between December 1955 and January 1956. The origin of the outbreak was the contamination by sewage, from one to six weeks aforementioned to the epidemic, of Jumna river, the source of water for the treatment plan. Alum and chlorine treatment prevented bacterial infections, but 30,000 cases of hepatitis came about among the residents. The detection of poliovirus in water after efforts around half a century ago put down the origin of water virology, which is actually environmental virology (Albert Bosch 1998).

Dissolved minerals, gases, and organic constituents may create aesthetically disgusting color, taste and odors. Some chemicals may be noxious, and some of the dissolved organic ingredients have been shown to be carcinogenic (Peavy et al, 1985).

Generally, water reduced its light transmitting capacity due to the existence of any type of dissolve or suspended solids. Turbidity in surface water is mostly caused due to the erosion of colloidal materials, such as clay, silt, rock fragments and metal oxide from soil (Greenberg et al., 1998). Taste and odor problem causing by turbidity, and it is not only aesthetically unacceptable, but it also hinders the distillation abilities of disinfectants (Peavy et al, 1985). A rapid decrease is observed in photosynthetic activity as the water gets more turbid, thus the organisms also reduce in number which

depends on vegetation. So overall in aquatic ecosystem the productivity is turn down because of turbidity.

The ability of a solvent to conduct electricity as to how much dissolved solids are present in the ionic form is known as electric conductivity. Conductivity is a numerical expression of the ability of an aqueous solution to carry an electric current. The units are *Micron Seimen per centimeter* = µs/cm which are mostly used. Measurement of conductivity and its relation to cations and anions and the total solid concentration has been widely used for pollution detection and monitoring the quality of agricultural and surface waters and in chemical oceanography for salinity determination (Ahmad, 2004).

The pH is of major importance in determining the corrosively of water. pH usually has no direct impact on water consumers, it is one of the most important operational water-quality parameters. Irritation to the eyes, skin, and mucous membranes is due to exposure to extreme pH values. Eye irritation and exacerbation of skin problems have been associated with pH values greater than 11. Hair fibers bloats have been reported with solutions of pH 10–12.5. In sensitive individuals, gastrointestinal irritation may also caused by high value of pH. Exposure to low pH values can also result in comparable effects. Below pH 4, redness and irritation of the eyes have been reported, the harshness of which increases with decreasing pH. When the value of pH decreases to 2.5, it cause damage to the epithelium is irreversible and extensive. In addition, it may have an indirect effect on health because pH can affect the degree of deterioration of metals as well as disinfection efficiency (WHO 2004).

Pure water is colorless. Many substances with which water comes into contact in nature or during human use may impart discernible taste and odor. These include; metals, minerals, and salts from the soil, end product of biological reaction and other constituents of waste water. In potable water analysis, the common practice is to determine only the true color produced by organic acid resulting from decaying vegetation in the water. However, iron oxides cause reddish brown color, the manganese oxide cause brown or blackish water. Alkaline water imparts a bitter taste

while metallic salts may give salty taste to water and reducing product of sulfur may produce a rotten egg taste and odor. The inorganic substances produce taste unaccompanied with odor, while organic material may impart both taste and odor. Colored water is aesthetically displeasing, unfit and unsafe for drinking. Moreover, highly colored water is inappropriate for laundry, dyeing, beverages, dairy products, manufacturing and other food processing, textile and plastic production (Peavy et al, 1985).

Ground and surface water can be contaminated by natural i.e. leaching of soil, and by human activities i.e. discharge from sewage treatment plant and industrial effluent, uncontrolled discharge from land fill sites and from chemical accidents and disaster, refuse dumping sites, transport accident, infiltration of polluted rain water , excess use of fertilizers etc. Moreover major anthropogenic activities; unsanitary disposal of refuse dump and garbage, increase use of agricultural pesticides and fertilizers, industrial operation, use of pit latrines and problem with septic tank system constitute causing ground water contamination (London et al., 2000).

In Azad Jammu and Kashmir" that in Azad Jammu and Kashmir (AJK) there is no municipal supplied drinking water in the valley. From long being streams are main sources of drinking water for locales. In AJK unplanned disposal of a large volume of solid waste including household, municipal, and industrial waste contaminate the sources of drinking water by pouring higher concentration of trace element and other pollutants, ultimately result in causing pollution (Javaid et al., 2008).

Chapter 3

Material and Method

3.1 Study Area

District Neelum is located in Azad Jammu & Kashmir, Pakistan. Neelum valley is about 200 km long bow-shaped deeply forested area in Azad Jammu & Kashmir. Neelum valley is sited parallel to Kaghan valley at the North & North-East of Muzaffarabad (capital). Neelum valley is to be found at both side of indigo blue Neelum River.

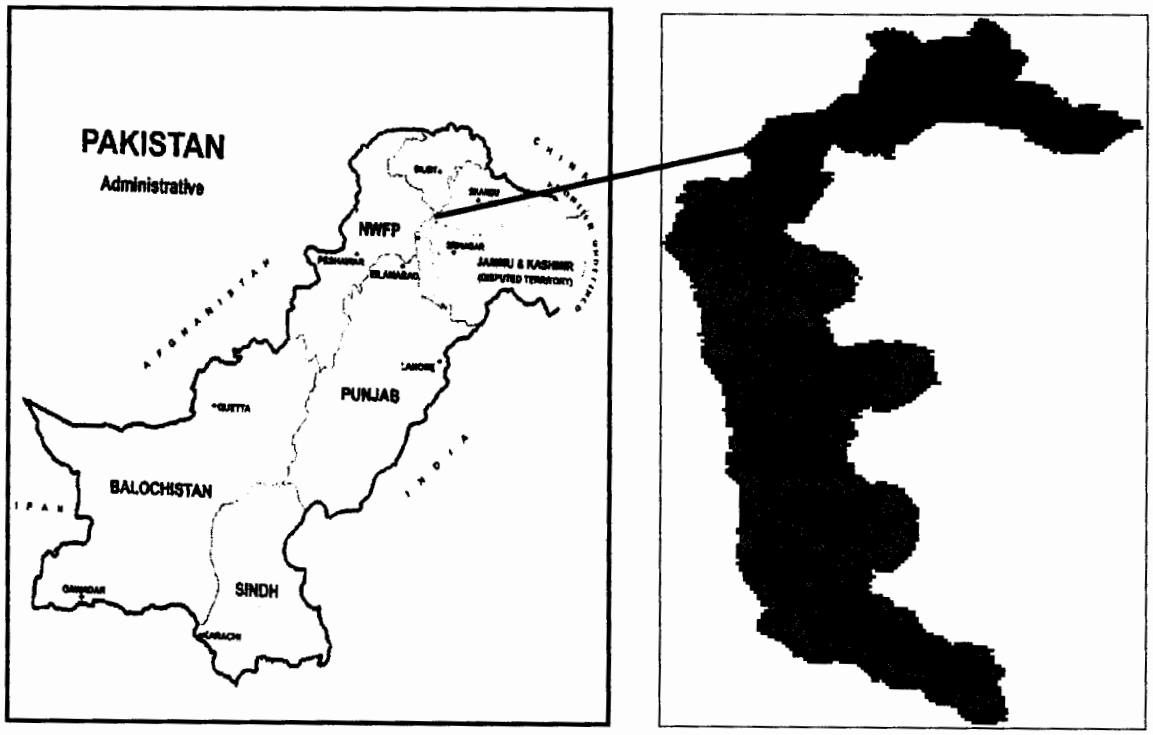

Figure: 3.1 Map of Pakistan & AJ&K

Total area of the district Neelum is 1500 sq.km. The total population of the district according to the 1998 census was 0.126 Million while it rose to 0.159 Million till 2006. The district is administratively subdivided into two Tehsils and five Union Councils.

3.2 Field Visits

At remote area in district Neelum, visits were made to different sites for the collection of water samples and information associated to study area. Meetings were arranged with local peoples. The water sampling in the field was started as per planned program. Sampling task was completed in five days started from 16th July to 20th July 2009.

Table 3.1 Description of total sampling of water supply schemes (WSS) from each Union Council in District Neelum

S. No	Activity	District	Union council (UC)	Number of WSS
1	Sampling	Neelum	Bharian	36
2	Sampling	Neelum	Doodhnayal	06
3	Sampling	Neelum	Kail	01
4	Sampling	Neelum	Shah Kot	20
5	Sampling	Neelum	Sharda	01

Total 64 water samples were collected from 64 water supplies schemes from 5 U.Cs in district Neelum. Generally, the water supply schemes in Kashmir including Neelum have been chiefly crafted from natural springs and lakes. From each water supply scheme sample was collected. Two types of water samples were collected from each scheme separately, one for Physico-chemical analysis and the other one for bacteriological analysis.

3.3 On Site Analysis

All Physico-chemical parameters i.e. color, odor, pH, Turbidity and EC and TDS were observed in the field. Bacteriological analysis was also carried out in the field by using field testing kits (Del agua and MERCK). For analysis of bacteriological samples standard protocol were adopted in the field. All necessary equipments i.e. incubators, faces masks, gloves, spirit lamps, sterilized cotton, lighter, spirit, permanent marker and kits were provided for on-site analysis of physico-chemical and bacterial samples.

3.3.1 Total Coliform

Microbiological analysis was also carried out in the field. To analyses total Coliform in water sample, the special Merck Kits were used. Standard protocol was adopted during the collection of samples in the field. For total Coliform samples analysis on site all the necessary equipments were provided. After taking sample the Merck kit was placed at 37°C in incubator for 24 hours. After the required time the samples were analyzed. If the color changed to bluish or green, it indicated the presence of total coliform qualitatively.

3.3.2 *Escherichia. Coli*

"The Oxfam-DelAgua Water Testing Kit, Product code: 2351"was used for analysis of *E.Coli*. For the collection of bacterial sample the standard procedure and protocol was adopted in the field. After the collection of samples and applying slandered procedure, the samples were placed at 44°C for 24 hours for quantitative analysis. On next day the *E.Coli* colonies were counted and the total number was recorded.

3.3.4 Color

Color of samples was observed by naked eye. During the sampling, the color of water was checked on the spot. For color observation no instrument was required.

3.3.5 pH

The pH of water samples was determined in the field by using "Oakton EcoTestr Pocket pH Meter". The meter was selected for testing samples due to its main features: +/- 0.1 per cent accuracy across full pH range; automatic temperature compensation; auto-buffer recognition and auto-calibration functions. Before conducting measurement of pH of water samples, the instrument was calibrated with distilled water.

3.3.6 Turbidity

Turbidity was measured by "Waterproof Portable Turbidity Meter EUTECH TN 100, Model IP67, Indonesia". First of all, Waterproof Portable Turbidity Meter EUTECH TN 100 was calibrated with standard turbidity suspensions i.e. 0.02,20 and 100 NTU (Nephelometric Turbidity Units). The sample was taken in specific crystal bottle and dried it with cotton cloth. Inserted the bottle in the Turbidity meter and placed it on plain surface, after while noted the reading three times and took the average of all three reading and noted.

3.3.7 Electric Conductivity

Electric conductivity of water sample was analysed with the help of "Hanna EC Meter - HI-98304 Dist4, ITALY". EC meter was calibrated and washed the graphite sensors with Calibration Solution: HI 70039P before analysis of each sample. After the calibration of EC meter, it dipped inside the water sample and reading was recorded.

3.3.8 Total Dissolved Solid

The TDS in water samples was determined with the help of "2540C, Standard method (2004)". First of all the water quality checker was washed with distilled water. Then water sample was taken into it. After power on, the water quality checker, the TDS

mode was selected by select button and reading was recorded. Bulb was washed with distilled water before putting in each water sample

3.4 Questionnaire Survey

Along with Physico-chemical analysis about epidemic condition of the local populous was carried out by questionnaire survey. Questionnaire survey was completed with the help of research team lead by the research Supervisor. The questionnaire included most of the questions with options of yes or no in answers which offers a dichotomous choice to them. The questionnaire survey was completed according to plan in time scheduled from 16th July, 2009 to 20th July 2009. From each of five union councils and capital of District Neelum (Autmuqam), 20 families were interviewed about their health status in last one year.

3.5 Hospital Record

For the confirmation of water born diseases in study area, the past two year i.e. from July 2007 to July 2009 hospitalized data was obtained from Thehsil Head Quarter Hospital Autmuqam District Neelum. This data included total record of the consulted patients' during that specific time period.

Chapter 4

Results and Discussion

Currently, the world is facing a serious problem of climatic change. This change is largely due to rise in human race and its associated activities. For the satisfaction of need, human population has not only put a great stress on the natural resources but also deteriorated the overall environment and his owns life. Modern science and technology play a vital role in fulfilling the demands of human, yet has failed to control the impact caused by human beings on natural resources like water, soil and air.

Pakistan being a developing nation, has threatened by serious environmental problem due to continuous rise in population and poor management of natural resources like land, water, and air. Northern areas of Pakistan are rich in natural resources. However, global trend in climatic change and local exploitation of the natural resources of these areas are really threatening aquatic and terrestrial environment. A major catastrophe occurred in these areas specifically by Earthquake in AJ&K, in October 2005 that has brought a big change in the landscape and associated freshwater resources of these areas. Besides, it has inflicted a great loss of life in the form of humans, animals and plants. So, present study was planned in this perspective to evaluate the quality of freshwater resource of district Neelum, one of the greenish valley of Azad Jammu and Kashmir, Pakistan.

4.1 Results

In district Neelum of AJ&K, 05 union councils (UC) were selected for the analysis of water quality and in them a total of 64 water samples (from source) were collected from 64 water supply schemes (16th July to 20th July 2009). The number of water supply schemes checked in each UC varied from 1-36. Sample collected were examined for 06

different parameters related to hygienic drinking water quality, besides they were also compared with WHO.

Out of five Union Councils, only one Union Council Kail, showed all water quality parameters falling within the acceptable limits of WHO STD. A total of 04 water samples, showed high turbidity than prescribed level of WHO. Water samples of all the U.Cs were having bacteriologically contaminated by Coliform. However the 12 out of all water samples haven't showed the presence of E-coli that are always taken as an important fresh water pollution indicator.

All the WSS's were located at various altitudes from 1131-2785 meters. The WSS .were maintained and monitoring by WMC under the supervision of CBO's. Among the 64 WSS's only 11 have found to be developed spring boxes while others have open flow. Only one infiltration gallery was developed out of 64 WSS's. Out of 64 WSS's, just one WSS was fenced. Only 07 WSS's were protected from flood diversion channels.
Contaminations in WSS's were playing a key role in diseases outbreak. Most of the people were infected by water born diseases i.e. Diarrhoea and dysentery, Cholera, Gastro intestinal tract infection etc through out the district.

4.1.1 Turbidity

The Prescribed limit of turbidity of fresh water is 5 NTU in WHO and 5-25 NTU in PSQCA, STD. In all the water samples collected, the minimum turbidity value was 0.08 and the maximum value was 9.3, and their average value was 1.45 NTU. The results showed that turbidity of 03 samples were higher than WHO STD. Turbidity of most of the samples i,e 61 was falling between 0-4.36 (NTU). Water supply scheme no(s); 16(9.3) 27(5.81) in UC Bharian and 53 (6.34) UC Shah Kot were having turbidity values exceeding from WHO.

4.1.2 pH

The prescribed limit of pH in fresh water is 6.5-8.5 in WHO STD. The average pH value in all water samples of different schemes was 8.05. The analyzed samples of drinking water were within permissible limit for pH. The range of pH value in the analyzed water sample was 7.3 to 8.8, however most of the samples i, e 60 samples were falling in the range of WHO limits. Only 04 samples were crossing the WHO permissible limits of pH i.e. Scheme Chalyana Dalla (8.7), Seeri (8.6), Khallara (8.6) and Markazy Shakupura (8.8) exceed from WHO limit.

4.1.3 Electric Conductivity

There is no guide line value (NGV) of Electric Conductivity in fresh water in WHO STD but the water having E.C above than 500 $\mu s/cm^3$ is not good quality water. Average electrical conductivity of all the water samples of 64 water supply schemes was 158.38, though it varied between $30\mu s/cm^3$ to $507\mu s/cm^3$. There are 64 water samples in 05 U.Cs all were falling in the range.

4.1.4 Total Dissolve Solids

The prescribed limit for TDS in fresh water in WHO STD is 1000 mg/l. Average TDS concentration in water samples was 87.34, however, TDS concentration in all water samples, varied from 26.95 to 304.2 mg/l. Most of the sample i, e 57 samples were falling in below the range of 150 mg/l. None of water sample exceed from WHO limit.

4.1.5 Diarrhoea and Dysentery

Diarrhoea and dysentery were most common diseases and infected a large number of people in study area. The 22.7% of all age people were averagely infected by Diarrhoea and dysentery, among these were; below 5 years 17.3%, 5-15 years 21.3%

and above 15 years 20.6%. Mostly population affected by this water born disease in all UC's of study area amongst:

Below 5 Years were 26% in UC Sharda and 25% in UC Bharian

5-15 Years were 25% in UC Kail and 24% in UC Doodhnayal

Above 15 Years were 25% in UC Ashkot and 23% in UC Kail

4.1.6 Cholera

Cholera was a chronic and common disease in district Neelum, originated from the use of unhygienic potable water. By average Cholera infected the 12.2% people of study area, among them were; 12.3% below 5 years, 10.5% 5-15 years and 7.2% above 15 years. Mostly population suffered from Cholera amongst:

Below 5 Years were 22% in UC Sharda and 19% in UC Doodhnayal

5-15 Years were 16% in UC Sharda and 12% UC in Autmuqam

Above 15 Years were 9% in UC Doodhnayal & Sharda and 7% in UC Bharian & Autmuqam respectively.

4.1.7 Typhoid

Typhoid was one of the chronic diseases caused by bacteria which exist in polluted and unsafe drinking water. Averagely Typhoid found in all age of people were 4% in targeted area, among them were; 1.16% below 5 years, 5.5% 5-15 years and 5.3% above 15 years. A number of peoples be ill with Typhoid amongst:

Below 5 Years were 5% in UC Doodhnayal and 1% in UC Sharda & Autmuqam

5-15 Years were 17% in UC Ashkot and 6% UC Doodhnayal

Above 15 Years were 12% in UC Doodhnayal Ashkot and 8% in UC Ashkot

4.1.8 Skin Infections

Averagely in all age of people Skin infections were 9.2%, among them were; 13.3% below 5 years, 9.5% 5-15 years and 9.67% above 15 years. Most of the people infected by skin infections in all UC's of study area amongst:

Below 5 Years were 50% in UC Ashkot and 10% in Autmuqam

5-15 Years were 13 % in UC Ashkot and 11% in Autmuqam

Above 15 Years were 12% in each UC Kail & Autmuqam and 10% in each UC Bharian & Ashkot

4.1.9 Eyes Infections

The 9.2% of all age people were averagely infected by Eyes infections, among these were; 2.5% below 5 years, 8% 5-15 years and 10.83% above 15 years. Most of the residents of study area were infected by eyes infections amongst:

Below 5 Years were 10% in Autmuqam and 3% in UC Sharda

5-15 Years were 12% in Autmuqam and 9% in each UC Sharda & Kail

Above 15 Years were 13 % in each UC Sharda & Kail and 12% in each UC Sharda & Autmuqam

4.1.10 Hepatitis

Averagely the people of all age groups infected by Hepatitis were 2.3%, amongst these were; 6.7% 5-15 years and 1.83% above 15 years. Hepatitis was in all UC's of study area amongst:

5-15 Years were 3% in UC Ashkot and 1% in Autmuqam

Above 15 Years were 4% in UC Ashkot and 2% in each UC Sharda & Bharian

4.1.11 Intestinal Worm

The interviewed population of study area was 7.83% averagely passed on an intestinal worm disease to, amongst them were; 10.33% below 5 years, 12.83% 5-15 years and 4.5% above 15 years. The residential suffered from Intestinal worm of all UC's of study area amongst:

Below 5 Years were 19% in UC Doodhnayal and 18% in UC Bharian

5-15 Years were 16% in UC Bharian and 14% UC Doodhnayal

Above 15 Years were 8% in UC Bharian and 5% in UC Ashkot

4.1.12 Gastro Intestinal Tract Infections

GIT infections infected the population of study area was 7% by average, amongst them were; 7% below 5 years, 11% 5-15 years and 18.83% above 15 years. Mostly population affected by GIT infections amongst:

Below 5 Years were 17% in UC Doodhnayal and 12% in UC Bharian

5-15 Years were 23% in UC Doodhnayal and 17% in UC Bharian

Above 15 Years were 33% in UC Doodhnayal and 21% in UC Bharian

4.1.13 Kidney Infections

Kidney infections were 3.67% by average in all age groups population of study area, amongst them were; 7% below 5 years, 11% 5-15 years and 18.83% above 15 years. The people affected by Kidney infections amongst:

Below 5 Years were 1% in each UC Sharda, Kail and Autmuqam

5-15 Years were 3% in each UC Sharda & Ashkot and 2% UC Kail

Above 15 Years were 8% in UC Sharda and 6% in UC Doodhnayal

4.1.14 Fever

Averagely14.33% people of all age groups were suffered from fever, amongst them were; 22.5% below 5 years, 18% 5-15 years and 16.5% above 15 years. A huge number of populations suffered from fever in study area amongst:

Below 5 Years were 50% in UC Ashkot and 27% in UC Sharda

5-15 Years were 24% in UC Kail and 20% UC Ashkot

Above 15 Years were 21% in UC Sharda and 19% UC Kail

4.2 Discussion

4.2.1 Biological Parameters

Ground and surface water can be contaminated naturally or because of numerous types of human activities including residential, commercial, industrial, and agricultural (U.S. E.P.A, 1986). Presence of biological agents such as fecal coliform bacteria, members of the family Enterobacteriacae, include Escherichia coli, Citrobacter, Enterobacter and Klebsiella and other species are considered very unhygienic, specially, when water

containing such organisms is used for drinking purposes. Coliforms are relatively easy to identify, and are usually present in larger numbers than more dangerous pathogens. E. coli as being the member of coliform bacteria is always taken as indicator of fecal pollution in water.

When a stream is polluted by fecal material, pathogenic bacteria, viruses, and parasites may be introduced, pretension a health risk to those who come in contact with the water, in the form of diseases like typhoid fever, hepatitis, gastroenteritis, dysentery, and ear infections in human beings. Municipal and rural water supplies can pass on human diseases such as cholera (Vibrio cholerae), typhoid fever (Salmonella typhi), shigellosis (Shigella), salmonellosis (Salmonella), and gastroenteritis (Campylobacter jejuni, Escherichia coli, Giardia lamblia). The threat of such disease transmission becomes more plausible as the population density of human increases, resulting contamination of public water supplies, through sewage (http://www.freedrinkingwater.com/water_quality/quality1/1-how-coliform-bacteria-affect-water-quality.htm).

Results of present study positively indicated the presence of fecal coliform especially in the form of E. coli in 52 out of 64 water samples of the supplies schemes (from source). Whereas, in 12 water supply schemes i.e. Six WSS in UC Bharian are Bugnar, Challi Lower, Doong, Garther, Kalas, Malkan Wali, One WSS in UC Kail is Maidan, Five WSS in UC Shah Kot Durmnar Lala, Katha Peeran Chunj, Lala Dayniath, Rawata Shinga no1, Rawta Lower, E. coli was not indicated. Bacterial measure in water can actually notify us that which scheme is good or bad and at what spot (source) the water in a scheme is being polluted through time and what could be associated reasons. Existence of bacterial pollutions as Total coliform and *E.Coli* clearly advocate that all the water sources whether ponds, lakes or streams were affected by human or animal's feces.

Groundwater is the source of drinking water for lots of people around the world, particularly in pastoral areas. In AJ&K, water is often carried out from source to consumers end through communal water source, such as storage tanks and water connection pipes. The storage of water for hours or even days allows the risk of fecal contamination within the household (Jenson et al., 2002). However, at some places where still pipes were not inaugurated, women often have to walk for hours to get the daily water ration for a family, from sources, in their utensils. While in some places water is provided only at certain time intervals during the day. Although connected to a supply system, the user has to store water to have a sufficient amount of water available during the non-supply periods. Water storage is therefore a necessity both for those who are connected to a non-continuous water supply system and those who depend on drinking water sources located outside the household perimeter.

The key reasons of pollution in dist Neelum is un-fortification of sources as it was also observed in the study area that none of the source was protected in the whole dist. Generally, washing (clothes), and bathing activities take place at sources. Rain water leaches the feces of animals and humans to sources and mix up their, resulting in accumulation of certain bacteria including pathogenic infections. Moreover, the handlings of water collection, from storage to consumer end, can contribute significant contaminants in water. Considering all factors, fecal incorporation in water from animal's sources is the major reason of water microbiology (Mintz et al., 1995). Children are another cause of contamination when they put their fecaly contaminated hands or utensils into the household water container. This domestic pathway of pathogen contamination of the household drinking water is independent of pollution at the source (Cairncross et al., 1996).

4.2.2 Physico-Chemical Parameters

Kashmir is basically located in the northern side of Pakistan having low to high rise mountains. This region is further categorized into mountainous ranges having different mineral in the form of limestone, marble, calcite, dolomite, gypsum, fluorite and apatite. As a result of geological variation and water rock interactions, varying concentrations of different chemicals may become part of flowing water source. Generally, the water supply schemes in Kashmir including Neelum have been chiefly crafted from natural spring. So considering the variation in water chemistry through time and space, water supplies schemes of different UCs, were examined for parameters viz E.C, pH, TDS, and turbidity. The results of most of the parameters including pH, TDS, E.C and turbidity were falling within permissible limits of water, although some variation or high value of some parameters were found at some instances.

Water is an important indicator to predict the health of an area. So, finding the water profile of an area tells the story of prevailing natural and artificial condition and inhabitants of the area. A detailed Physico-chemical characterization of water from 64 water schemes (from source) in 05 UCs of district Neelum showed varying conditions. Results showed that most of the water supplies were not facing any serious threats in form of chemical agents. Nevertheless, certain water schemes of different U.Cs were specifically indicated pollution load of single to multiple water quality parameters (E.C, turbidity and pH) exceeding the desired limits of WHO.

Suspended particles in water absorb heat from the sunlight and make it warmer. Turbidity also results in reducing the concentration of oxygen in the water. Suspended particles in water scatter the sun light, thus decreasing the photosynthetic activity, inhibiting growth of submerged aquatic plants and associated animals. Urbanization and associated construction activities contribute a large amount of turbidity and sedimentation in water bodies specifically during rain and storm water runoff. Contaminants like viruses or bacteria may be attached to the suspended solids, and

they become safe from disinfectants like chlorine and ultraviolet (UV) radiations. So, high turbidity levels in water, in other words, can indirectly support the spread of infectious diseases to human and other vertebrates (http://www.lenntech.com/turbidity.htm).

Out of 64 water samples, only 03 samples were having high turbidity levels than permissible limits of WHO. Scheme no(s); 16(9.3) 27(5.81) in UC Bharian and 53 (6.34) UC Shah Kot, showed high turbidity level. High turbidity and nitrate levels in water are normally linked to: run off and seepage of chemical from fertilized used land, farming practices, disposal of municipal waste water, solid waste disposal practice and erosion (Nebbache et al., 2001). All these factors exaggerate during rainy season and was also noticed in current study, as sampling was carried out during the month of August/September (Gelberg et al., 1999; Gatseva et al., 2000).

Electrical conductivity (EC) estimates the amount of total dissolved salts (TDS), or the total amount of dissolved ions in the water. High E.C value in water is the result of dissolution of carbonate minerals, waste water from sewage treatment plant, wastewater from septic systems and drain field on-site of wastewater treatment and disposal systems, urban runoff, agricultural runoff of water. Evaporation of water from the surface of lakes concentrates the dissolved solids in the remaining water which increases the value of E.C. (Michaud, 1991). E.C determines the flow rate of an electric current in water. Temperature and CO_2 affect E.C by about 2% /1°C, dissolved CO_2 increases conductivity without increasing mineral salt content respectively (Kahlown et al., 2008).

E.C is the most important factor for consumption fresh water quality. Water having E.C in between 5-500µs/cm^3 represent good water, however, water having E.C value beyond 500µs/cm^3 is always consider bad for health. All water samples were found in five UCs within the WHO limits E.C values beyond 500µs/cm^3.

Only 04 samples were crossing the WHO permissible limits of pH i.e. Scheme no(s); 9(8.7) in Barian, 37(8.6) in Sharda and 40(6.8) & 42(8.8) in Doodhnayal, showed high pH level. The other parameter TDS were falling within the permissible limits of WHO.

4.3 Existence of the Water Supply Schemes

Neelum valley is located on both side of the Neelum River at the North & North east of the Capital city (Muzarffarabad) of AJ&K. District Neelum is completely mountainous region. Natural streams and springs are the main source of drinking water for the locales of study area .The WSS's were distributed in various areas and usually located at upper sites of settlement area in Neelum valley.

4.3.1 Altitude

The water supply schemes were located at different heights and altitude at the mountainous region of Neelum valley. The schemes were located between the highest, Challi Bala scheme (UC Bharian) situated at the altitude of 2785 meters and Katha Sumari scheme (UC Bharian) at the lowest altitude of 1131 meters. The discharge of water from the WSS also varied. Water supply schemes discharge were calculated with the unit of 10 Liter/Time. The highest quantity of water was discharged from the WSS Falakhan (UC Bharian) which was 10 liter in only one second, while the smallest quantity 10 Liter water discharged at 10 minuets from the WSS Garther (UC Bharian).

4.3.2 Type of WSS and Its Maintenance

Each water supply scheme were monitoring by locally developed committees known as Water Management committees (WMC). Most of WMC were working under local government body known as CBO while some were working autonomously to look after the WSS's.

Nearly all of the WSS's were not in good conditions. Among the 64 WSS's only 11 have found to be developed spring boxes while other has open flow. Only one infiltration gallery was developed found amongst 64 WSS's. Out of 64 WSS's, just one WSS was fenced. Only 07 WSS's were found that were protected from flood diversion channels. Due to the absence of proper maintenance it will be contaminated easily which can lead to sever health risks.

4.3.3 Specific Diagnostic Indicators of WSS

The WSS's were distributed in different area of Neelum valley. Most of the sources were open and have no fencing and spring boxes so the risk of contamination was greater. Due to lake of proper maintenance and fencing the bird, animal and human excreta were found within 10 meters of the springs. In study area only one spring have protection from animal and human access within 10 meters. Other nine WSS's had protection from other contamination i.e. soap of washing cloths etc. The study area was totally steep but still there were 12 WSS's with stagnant water around the sources.

4.4 Questionnaire Survey

Along with Physico-chemical analysis a questionnaire survey from the local populous were also carried out. Questionnaires were completed with the help of research team lead by Research Supervisor. The questionnaire included most of the questions with options of yes or no in answers which offers a dichotomous choice to them. The questionnaire had different questions related to the following:

4.4.1 Family Profile

Age and sex composition of each family member from the elder one to younger was considered, and noted the total number of family persons.

4.4.2 Types of Diseases

To investigate that which type of water born diseases (Diarrhea and Dysentery, Cholera, Typhoid, Skin Infection, Eyes Infection, Hepatitis, Intestinal Worms, GIT Infection, Kidney Infection) experienced by the family members from last one year. How many times the patient suffered from health problems? To fulfill this purposes and a questionnaire survey was attempted and collect the record from the residents of district Neelum.

(i) Autmuqam

Autmuqam is the main populated and sub-divisional headquarters of the district Neelum. In this area of Neelum valley mostly population used water from natural streams. The local people of this area have no attitude towards chlorinated or boiled water due to this in all age people are faced with the water born diseases.

The Fig-4.1 shows that Diarrhea and dysentery were experienced by 20% in above 15 years, 21% in 5-15 years and in below 5 years of age. Cholera affected 7% in above 15 years, 12% in 5-15 years of age and 15% in below 5 years of age. Typhoid was found in above 15 years of age 4%, and 1% in 5-15 and below 5 years of age. Skin infections were 12% in above 15 years, 11% 5-15 years and 10% below 5 years. Eyes infections were 12% in above and 5-15 years and 11% in below 5 years. Hepatitis was found rarely 1% in above 15 and 5-15 years. Intestinal worms were 4% in above 15 years 13% in 5-15 and 17% in below 5 years. Gastro intestinal tract infection is found 4% in above 15 years, 13% & 17% in 5-15 years and below 5 years respectively. Kidney infections were 5% in above 15 years, 1% in 5-15 and below 5 years. Fever is part of our body's immune system. The temperature of our body increase when our bodies are combating infections or germs like bacteria and viruses etc In above 15 years 17%, 16% of 5-15 years and 16 % of below 5 years were suffering from fever.

combating infections or germs like bacteria and viruses etc In above 15 years 17%, 16% of 5-15 years and 16 % of below 5 years were suffering from fever.

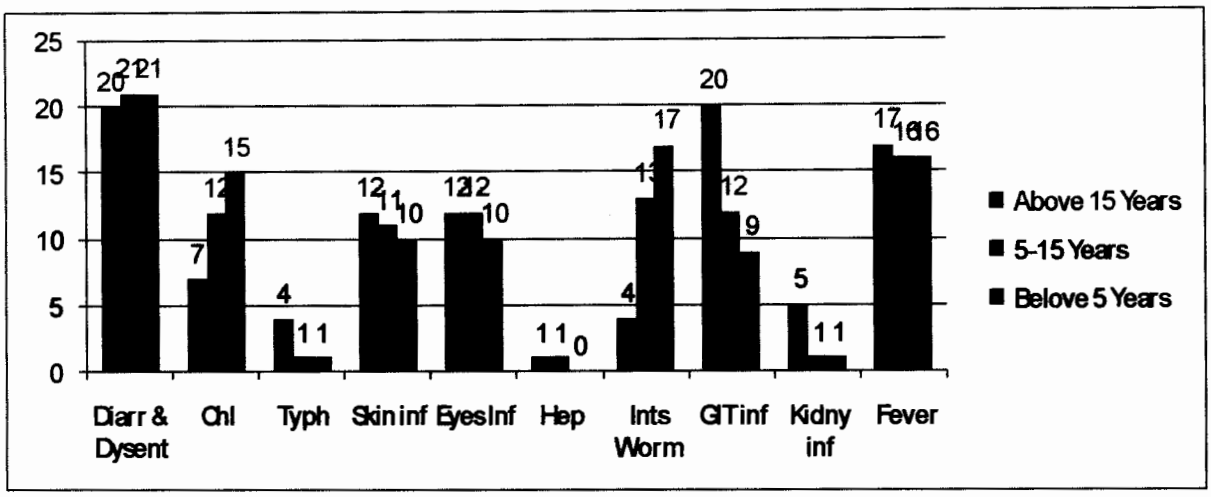

Fig -4.1: Age Wise Disease %age of Autmuqam

(ii) UC Doodhnayal

The graph of UC Doodhnayal shows that Diarrhea and dysentery was in above 15 years 15%, 24% in 5-15 years and 20% in below 5 years of age. Cholera 9% in above 15 years, 10 % in 5-15 years and 12% in below 5 years was observed. Typhoid was in above age 12%, 6% in 5-15 and 8% in below 5 years. Skin infection affected 5% in above 15 years, 6% 5-15 years and 5% below 5 years peoples. In above 15 years 4%, 5% in 5-15 years, and 3% below 5 years of population faces eyes infection. Hepatitis was 1% in above 15 years only. From Intestinal worm 4% above 15 years, 14% 5-15 years and 11% below 5 years were suffered. GIT infections were 33% in above 15 years, 23% & 26% in 5-15 years and below 5 years respectively. Kidney infections were found 6% in above 15 years and 2% in below 5 years. In above 15 years 17%, 16% of 5-15 years and 16 % of below 5 years was being ill with fever.

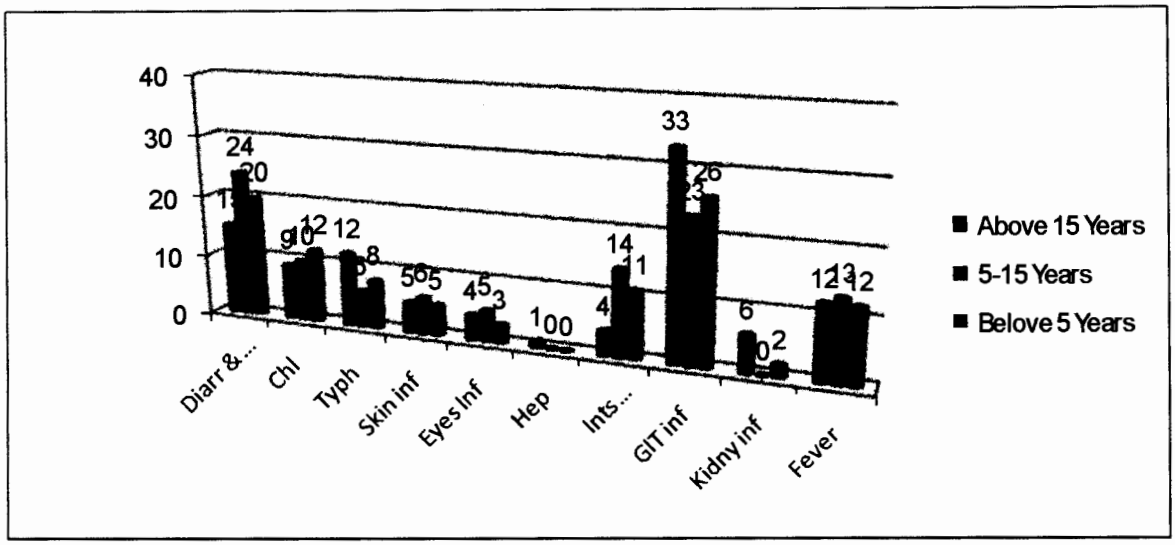

Fig-4.2: Age Wise Disease %age of UC Doodhnayal

(iii) UC Kail

The Fig-4.3 shows that Diarrhea and dysentery were experienced by 23% in above 15 years, 25% in 5-15 years and 8% in below 5 years of age. Cholera affected 5% in above 15 years, 4% in 5-15 years of age and 2% in below 5 years of age. Typhoid was found in above age 3%, and 3% in 5-15 years. Skin infections were 12% in above 15 years, 10% 5-15 years and 2% below 5 years. Eyes infections were 13% in above 15 years, 9% in 5-15 years. Hepatitis was affected 1% of above 15 years. Intestinal worms were 4% in above 15 years 12% in 5-15 and 2% in below 5 years. GIT infections were enduring 17% in above 15 years, 3% in 5-15. Kidney infections were 3% in above 15 years, and 2% in 5-15 years. In above 15 years 19%, 24% of 5-15 years and 10% of below 5 years were suffering from fever.

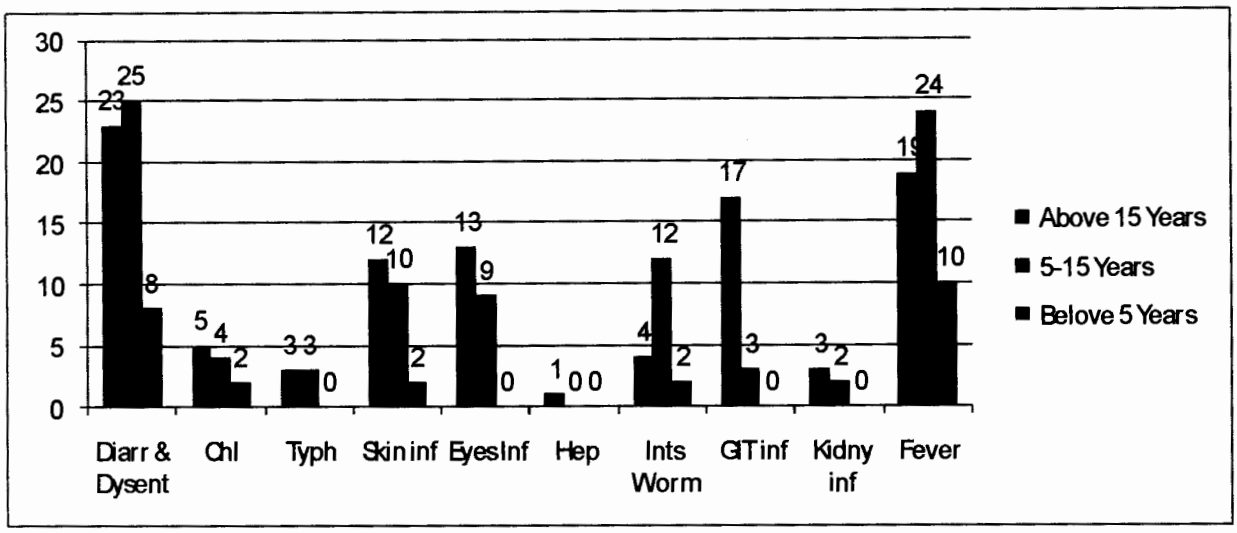

Fig -4.3: Age Wise Disease %age of UC Kail

(iv) UC Bharian

In US Bharian Diarrhea and dysentery was found 20% in above 15 years, 24% in 5-15 years and 25% in below 5 years of age. Cholera is 7% in above 15 years, 11% in 5-15 years of age and 16% in below 5 years of age. Typhoid was found in above age of 3%, and 2% in 5-15 and 0% in below 5 years. Skin infection was found 10% in above 15years, 8% 5-15 years and 8% below 5 years. 12% in above 15 years, 6% in 5-15 years of age, and 2% in below 5 years of old population faces eyes infection. Hepatitis is very rare found only 2% in above 15 years, 0% in below 15 years. 8% in above 15 years, 16% in 5-15 and 18% in below 5 years were suffering from intestinal worm and associated problems. Gastro intestinal tract infection is found 21% in above 15 years, 17% & 12% in 5-15 years and below 5 years respectively. Kidney infection is found 3% in above 15 years of age, in 5-15 and below 5 years of population faces 0%. In above 15 years 14%, 17% of 5-15 years and18% of below 5 years was suffering from fever (Fig.4.4).

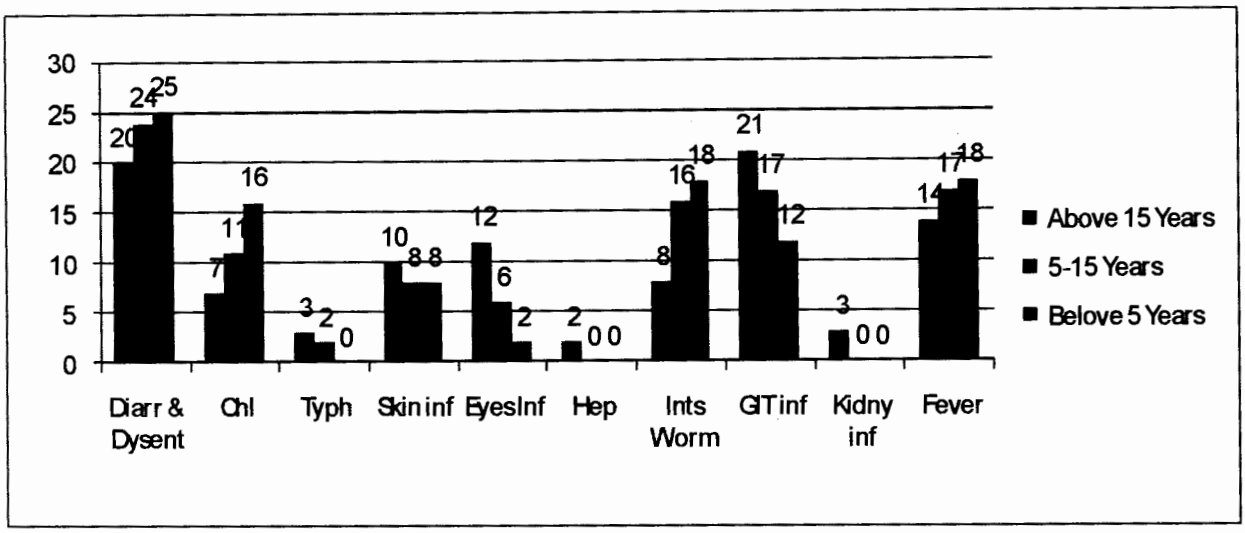

Fig -4.4: Age Wise Disease %age of UC Bharian

(v) UC Ashkot

The survey of UC Ashkot showed that in above 15 years and 5-15 years the diseases found were; Diarrhea and dysentery 25% &13%, Cholera 6% & 10%, Typhoid 8% &17%, Skin infection 10% & 13%, eyes infections 13% & 7%, Hepatitis 4% & 3%, intestinal worm 5% & 13%, GIT infections 8% & 0%, Kidney infections 5% & 0%, and fever 16% & 20% respectively. Only two children's were interviewed in which 50% skin infections and 50% fever noticed (Fig.4.5).

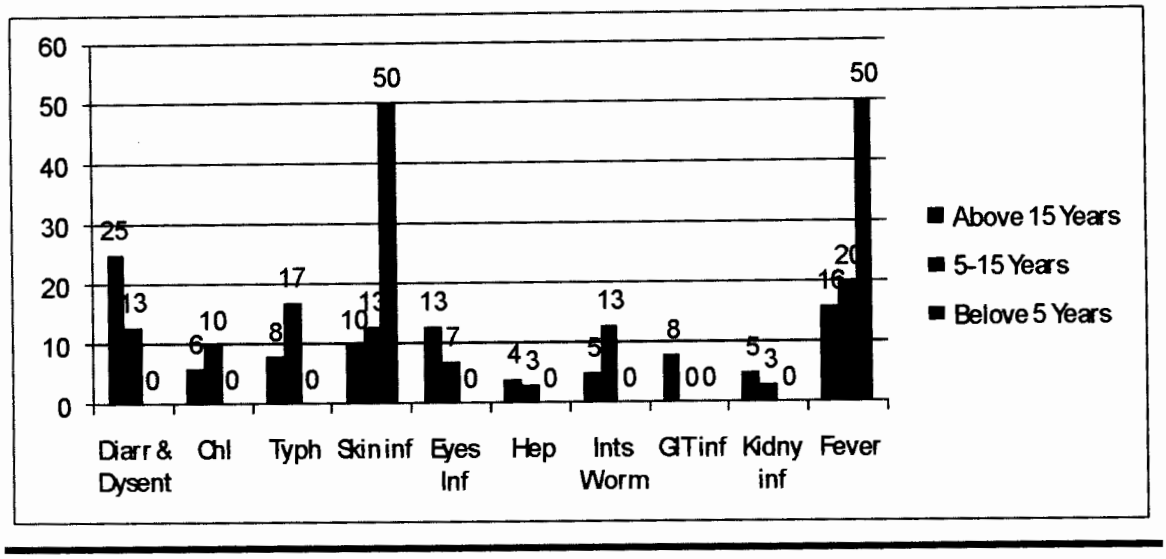

Fig-4.5: Age Wise Disease %age of UC Ashkot

(vi) UC Sharda

The survey of UC Sharda was shown on graph which indicates age wise distribution of each disease in percentage. Diarrhea and dysentery is found in above 15 years old is 21%, 21% in 5-15 years old and 26% in below 5 years of age. Cholera is 9% in above 15 years, 16% in 5-15 years of age and 22% in below 5 years of age. Typhoid is found in above age 2%, and 4% in 5-15 and 1% in below 5 years. 9% in each of age group population were infected by skin infection respectively. 11% in above 15 years, 9% in 5-15 years of age, and 3% in below 5 years of old population faces eyes infection. Hepatitis is very rare found only 2% in above 15 years, 0% in below 15 years. 2% in above 15 years, 9% in 5-15 and 6% in below 5 years were suffering from intestinal worm and associated problems. Gastro intestinal tract infection is found 14% in above 15 years, 11% & 5% in 5-15 years and below 5 years respectively. Kidney infection is found 8% in above 15 years of age, 3% in 5-15 and below 5 years of population faces 1%. 21% in above 15 years, 18% of 5-15 years and27% of below 5 years populous was suffering from fever (Fig.4.6).

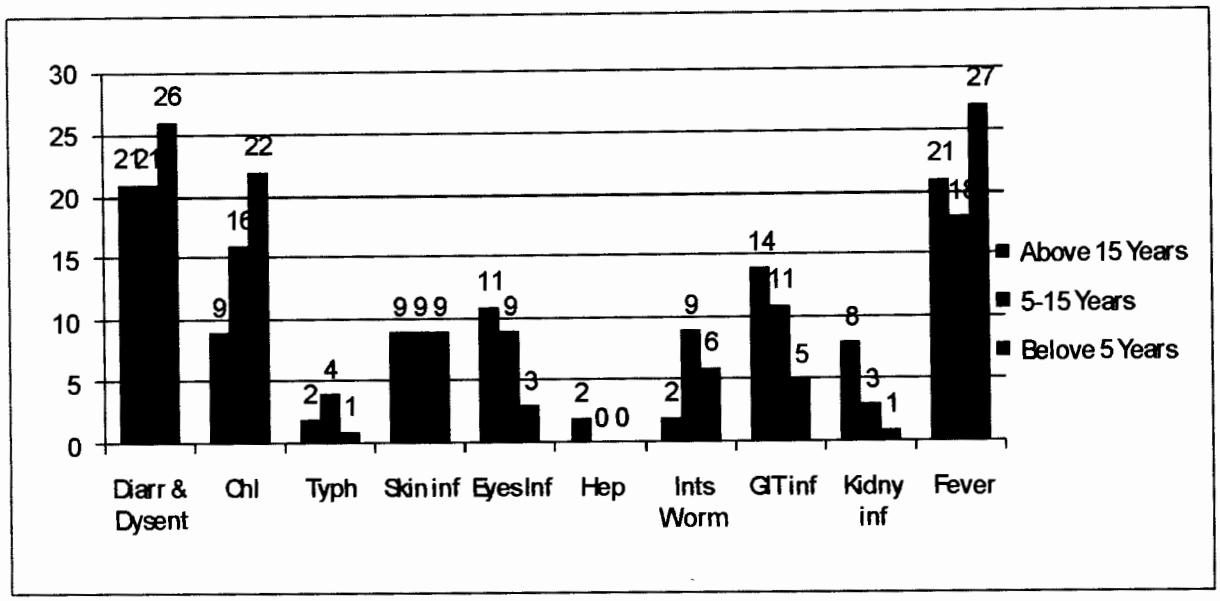

Fig -4.6: Age Wise Disease %age of UC Sharda

4.4.3 Source/Reason of Disease

The diseases causing microbes or pathogen get enter through food and water in human body easily, and make the person ill. In the study area it is observed through survey that the majority of the diseases in this area were caused by improper food and mostly by water. The water supply schemes were not properly fenced and protected from fecal contamination. The women wash their clothes and bathing children at or near source hence the risk of contamination more increase both chemically and microbiologically. The same water is used for drinking purposes by the local population which led to harmful and dangerous health effects.

4.4.4 Repetition of Water Born Diseases

Due to the use of unsafe and unprotected drinking water of natural streams the diseases were repeated several times. In last one usually each and every patient of the study area were suffered from different type of water born diseases. In the below 5 years of age each one of UC Bharian 2.5, UC Doodhnayal 1.98 , UC Kail 3.02 , UC

Ashkot 0.15 , UC Sharda 1.61 and Autmuqam 2.84 times repeatedly suffer from water born diseases and infection during last one year. In 5-15 years of age have also face these problem and every body of UC Bharian 3.75, UC Doodhnayal 3.46 , UC Kail 1.8 , UC Ashkot 0.4 , UC Sharda 3.0 and Autmuqam 2.5 times repeatedly suffer from water born diseases and infection during last one year. Every one of the above 15 years of age become sick and face infection during past one year are of UC Bharian 3.86, UC Doodhnayal, UC Kail 5.07, UC Ashkot 0.76, UC Sharda 3.27 and Autmuqam 3.49 times each. Among all of the age groups each and every person face water born diseases and infection repeatedly in of UC Bharian 4.11, UC Doodhnayal 3.9, UC Kail 2.5, UC Ashkot 0.7, UC Sharda 3.68 and Autmuqam 3.68 times each.

4.4.5 Hospitalized from Water Born Diseases

The disease causing factors and microorganisms are found everywhere in nature. These cause some time very severe and chronic disease in human beings as well as in other animals. The results clearly show that in each of UC high number of population among different age groups were hospitalized in sever condition from water born diseases in last one year. In UC Bharian 20%, UC Doodhnayal 32%, UC Ashkot 16.6%, UC Sharda 6.6% and Autmuqam 15% children's of below 5 years were hospitalized in chronic conditions. Among 5-15 years of age population from UC Bharian 9.4%, UC Doodhnayal 12.7%, UC Kail 9%, UC Ashkot 2.7%, UC Sharda 6% and Autmuqam 15% were hospitalized. UC Bharian 13.7%, UC Doodhnayal I 45.5%, UC Kail 2.7%, UC Ashkot 23%, UC Sharda 12% and Autmuqam 37.7% peoples of above 15 years of age were hospitalized in serious condition. Population of all age of groups which were hospitalized from UC Bharian 13.65%, UC Dhoonayal 23.6%, UC Kail 4%, UC Ashkot 16%, UC Sharda 9.4% and Autmuqam 27.5%.

4.4.6 Use of Boiled Water

The enteric pathogens are transmitted through water (Hunter et al., 2002). When such water which has these harmful microbes is used without treatment chemically or

traditionally can cause sever and chronic health risks in human being. Unfortunately in the District Neelum major of the population used water without any chemically or traditional treatment. This survey result identify that a very little number of people of different age groups used boiled water. In below 5 years of age from UC Kail 3%, UC Ashkot 50% and UC Sharda 6.6% used boiled water for drinking. Used to drink boiled water by 5-15 years of population were from UC Kail 6.6%, UC Ashkot 65% and UC Sharda 20%. From UC Kail 6.3%, UC Ashkot 72% and UC Sharda 13.7% peoples of above 15 years used to drink boiled water. UC Kail 6%, UC Ashkot 67.7% and UC Sharda 15% total population of all age of groups used boiled water for drinking purposes. In Ashkot the percentage of people who used boiled water was much higher than the other UC's; it is because that in this particular area awareness was generated about disease and water by a young woman who has been worked as a social worker with one of the NGO.

4.4.7 Percentage of Diseases in Union Council

Diseases caused by water are the most important concern about the quality of water. These enteric pathogens include a broad variety of viruses, bacteria and protozoan parasites (WOK Grabow 1996). These pathogen causes sever and chronic heath risk. Parasitic diseases such as dysentery and diarrhoea are the major and main causes of high mortality rate in developing countries. In these countries, over five million children under the age of five die annually from severe diarrhoeal diseases (A. Longanga Otshudi et al). In the study area diarrhoea and dysentery was commonly found. The Fig.4.7, point out percentages of the specific water born diseases. It is noticed that diarrhoea and dysentery are present at high ratio than the other diseases in each UC. Diarrhoea and dysentery are 20% in Autmuqam, 20% in UC Doodhnayal, 29% in UC Kail, 20% in UC Bharian, 22% in UC Ashkot and 23% in UC Sharda among all of the record diseases. Cholera is caused by Vibrio cholerae (Myron M. Levine et al 1983). In the study area it was observed that cholera was 10% in Autmuqam, 12% in UC Doodhnayal, 6% in UC Kail, 10% in UC Bharian, 22% in UC Ashkot and 13% in UC

Sharda. Salmonella Typhae is the causing pathogen of typhoid which are transmitted from feces to ingestion, which is one of the chronic diseases . Typhoid were noted 2% in Autmuqam, 8% in UC Doodhnayal, 2% in UC Kail, 2% in UC Bharian, 7% in UC Ashkot and 3% in UC Sharda.

For Skin Soft Tissue Infection Staphylococcus aureus and Streptococcus spp., especially Streptococcus pyogenes, are the predominant pathogens, although for skin infections Corynebacterium spp., Pasteurella spp. and Enterobacteriaceae are also commonly concerned (Mark E. Jones et al 2003). In the study area a number of populations were observed who suffered from skin infections. Skin infection is one of the common diseases among the local of Neelum Valley. The share of each concerned area in skin infection is Autmuqam 11%, UC Doodhnayal 3%, UC Kail 11%, UC Bharian 9%, UC Ashkot 9% and UC Sharda 10%.

Infections of the eyes can be caused by the pathogen known as Moraxella (Rusin PA, 1997). Eyes infections were found in concerned areas, Autmuqam 12%, UC Doodhnayal 3%, UC Kail 10%, UC Bharian 9%, UC Ashkot 11% and UC Sharda 10%. Virus can cause Hepatitis and it is of several types i.e. Hepatitis A, B, C & E. Hepatitis was observed in, Autmuqam 1%, UC Dhoonayal 0%, UC Kail 0%, UC Bharian 1%, UC Ashkot 11% and UC Sharda 1%. Intestinal worms were found in, Autmuqam 9%, Dhoonayal 11%, Kail 7%, Bharian 12%, Ashkot 3% and Sharda 5%. Gastrointestinal Infection is a group of diseases caused by different enteric pathogens with varying severity, which are transmitted by food and/or drink contaminated with faecal material. GIT infections were in, UC Autmuqam 15%, UC Doodhnayal 26%, UC Kail 11%, UC Bharian 18%, UC Ashkot 6% and UC Sharda 12%.

Kidneys play a vital role in our body, called filtration plant of body. Kidney infections (Pyelonephritis) are caused by bacteria. Build-up of bacteria and proteins can cause crystals to form, which are known as kidney stones. Kidney infections were investigated in, Autmuqam 3%, UC Doodhnayal 2%, UC Kail 3%, UC Bharian 2%, UC Ashkot 6% and UC Sharda 6%. Fever itself is not a diseases but an indication of other aliments.

Fever was to be found in, Autmuqam 16%, UC Doodhnayal 12%, UC Kail 21%, UC Bharian 15%, UC Ashkot 4% and UC Sharda 18%.

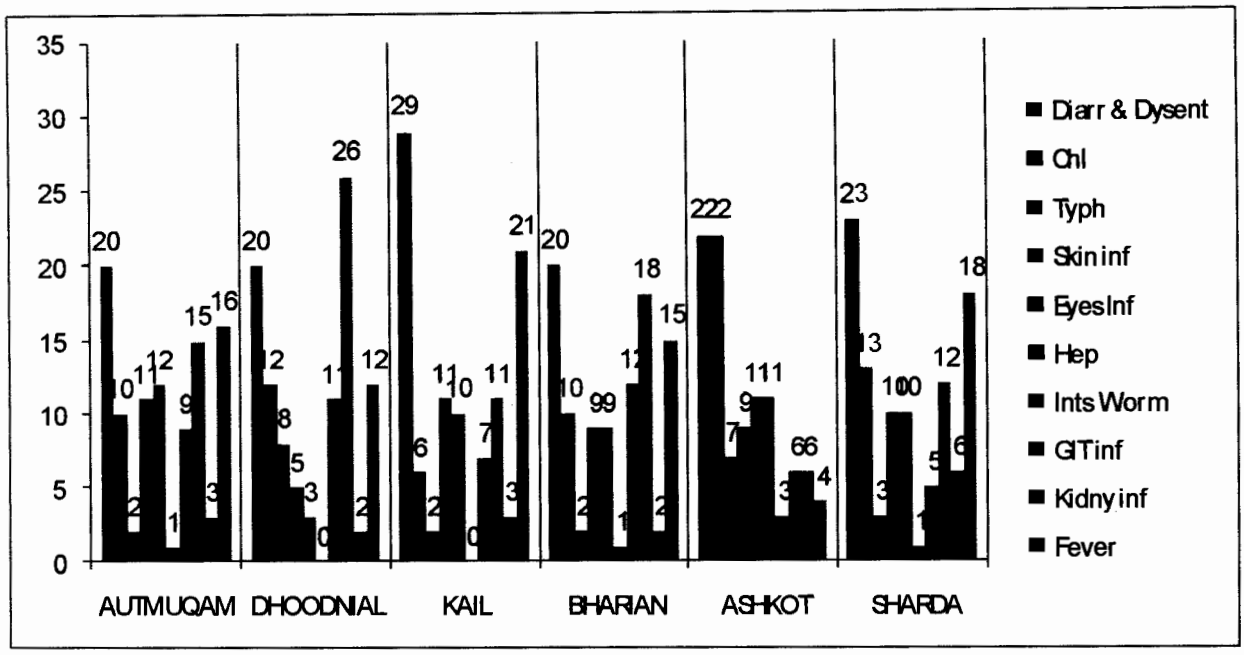

Fig -4.7: Percentage of each type of disease UC Wise

5.4.8 Population Infected by Water Born Diseases

Pure and clean potable water has become assign of a healthy lifestyle. Drinking water for health makes sense when a man knows the essential role of drinking water for human body. When this water carries pathogens and dissolves chemicals or solids then it causes severe health problems. In study area different types of water born diseases are identified which affected a huge number of population in last one year. Autmuqam 69%, UC Doodhnayal 49%, UC Kail 41%, UC Bharian 76%, UC Ashkot 23% and UC Sharda 61% of population suffered from diarrhoea and dysentery. From cholera Autmuqam 35%, UC Doodhnayal 19%, UC Kail 9%, UC Bharian 34%, UC Ashkot 26% and UC Sharda 36% population was affected. Autmuqam 8%, UC Doodhnayal 19%, UC Kail 3%, UC Bharian 8%, UC Ashkot 8% and UC Sharda 7% population faced the typhoid diseases in specific time era. Population effected by Skin infections was

Autmuqam 39%, UC Doodhnayal 11%, UC Kail 15%, UC Bharian 32%, UC Ashkot 10% and UC Sharda 26%.

Residents of Autmuqam 41%, UC Doodhnayal 8%, UC Kail 14%, UC Bharian 29%, and UC Ashkot 13% and UC Sharda 26% experienced eyes infections. From Hepatitis the residents of Autmuqam 3%, UC Doodhnayal 1%, UC Kail 0%, UC Bharian 3%, UC Ashkot 13 and UC Sharda 3% effected during last one year. Autmuqam 31%, UC Doodhnayal 27%, UC Kail 10%, UC Bharian 41%, UC Ashkot 4% and UC Sharda 14% population be ill with intestinal worms and associates. GIT infections appear in the residents of Autmuqam 52%, UC Doodhnayal 62%, UC Kail 16%, UC Bharian 62%, UC Ashkot 7% and UC Sharda 34%. Kidney infections were experienced by the local populas of Autmuqam 10%, UC Doodhnayal 6%, UC Kail 5%, UC Bharian 5%, UC Ashkot 5% and UC Sharda 16%. Autmuqam 56%, UC Doodhnayal 30%, UC Kail 30%, UC Bharian 53%, UC Ashkot 5% and UC Sharda 49% peoples were suffered from fever.

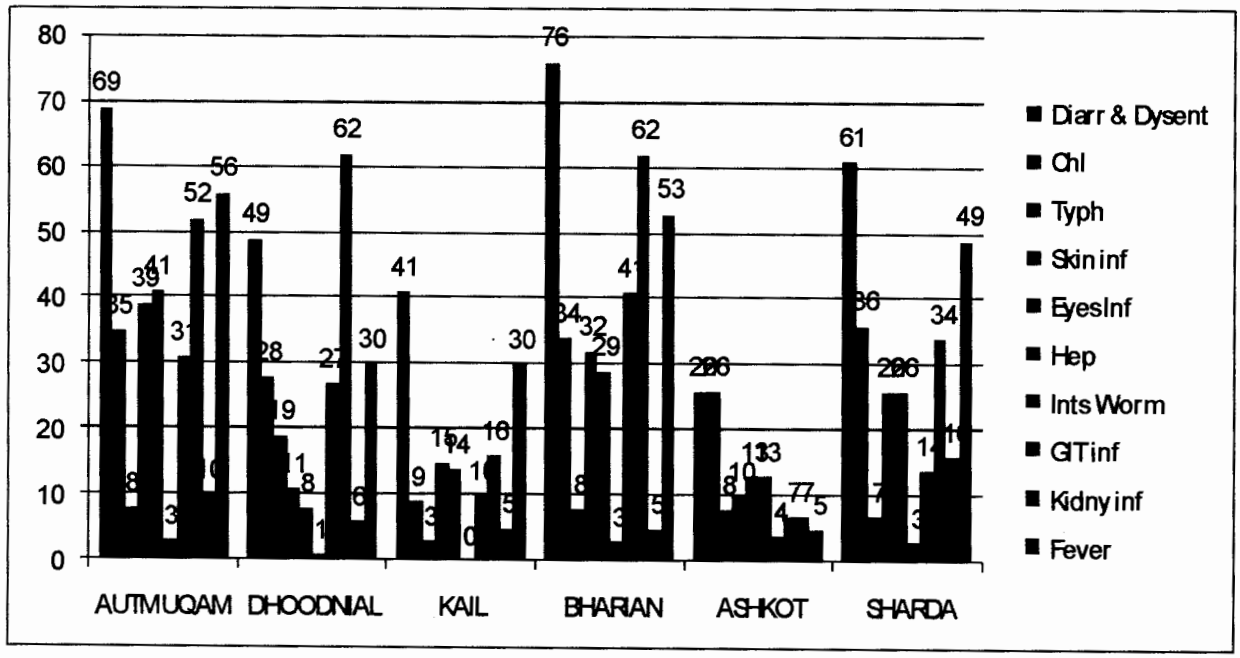

Fig -4.8: Percentage of population infected by water born diseases

4.5 Hospital Data

This data was obtained from Thehsil Head Quarter Hospital Autmuqam, District Neelum. It contains all the patients' record that were consulted and treated from July, 2007 to July, 2009. It also includes the record of all those patients who were consulted in dispensaries, which located and working in different areas of district Neelum. The dispensaries submit their weekly record in Head Quarter Hospital Autmuqam. The Thehsil Head Quarter Hospital Autmuqam further submits its monthly record of consulted patients to WHO.

4.5.1 Total Consultation from July, 2007 to July, 2009

Fig.4.8 point out that the residents of district Neelum were ill with Acute Diarrhoea 9.79%, Acute Jaundice Syndrome 0.02%, Bloody Diarrhoea 0.8%, Injuries 0.09%, Lower Respiratory Track Infection 10.15%, Malaria 0.06%, Measles 0%, Others 47.86%, Cholera 0%, Scabies 5.11%, Unexplained Fever 1.08%, Upper Respiratory Track Infection 25.05%. Everything else, for example body aches, headache, depression, or other psychiatric problems, head lice, joint pain etc are included in other diseases.

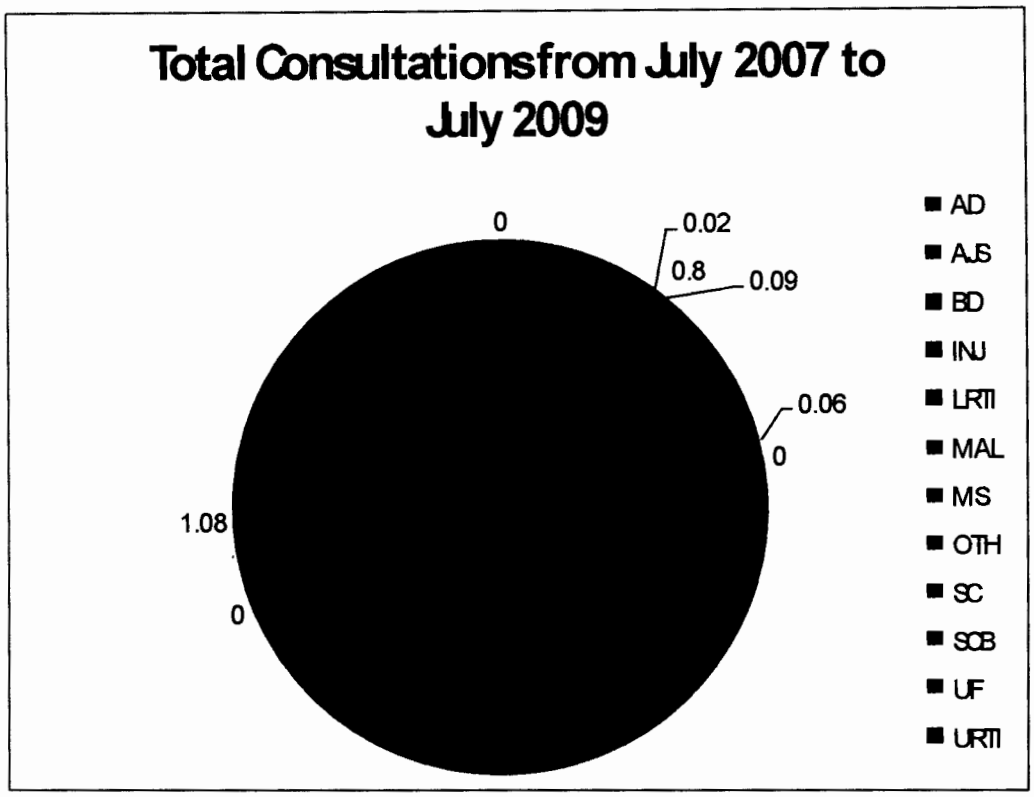

Fig -4.9: Percentage of patients Consulted in Thehsil Headquarter Hospital Autmuqam District Neelum

4.7.2 Age Wise Total Consultation from July, 2007 to July, 2009

The ratio of population of study area affected by various infections and diseases were differing in below five years of age and above five years of age in the specific period of time from July, 2007 to July, 2009. Below of 5 years of age population were suffered from AD 16.13%, AJS 0%, BD 0.79%, INJ 0.09%, LRTI 13.49%, MAL 0.04%, MS 0%, OTH 33.24%, SC 0%, SCB 3.12%, UF 0.93%, UTRI 32.17%. While the percentage of people experience health problems in last two years were AD 7.93%, AJS 0.03%, BD 0.81%, INJ 0.09%, LRTI 9.16%, MAL 0.06%, MS 0%, OTH 52.17%, SC 0%, SCB 5.69%, UF 1.12%, UTRI 22.94%.

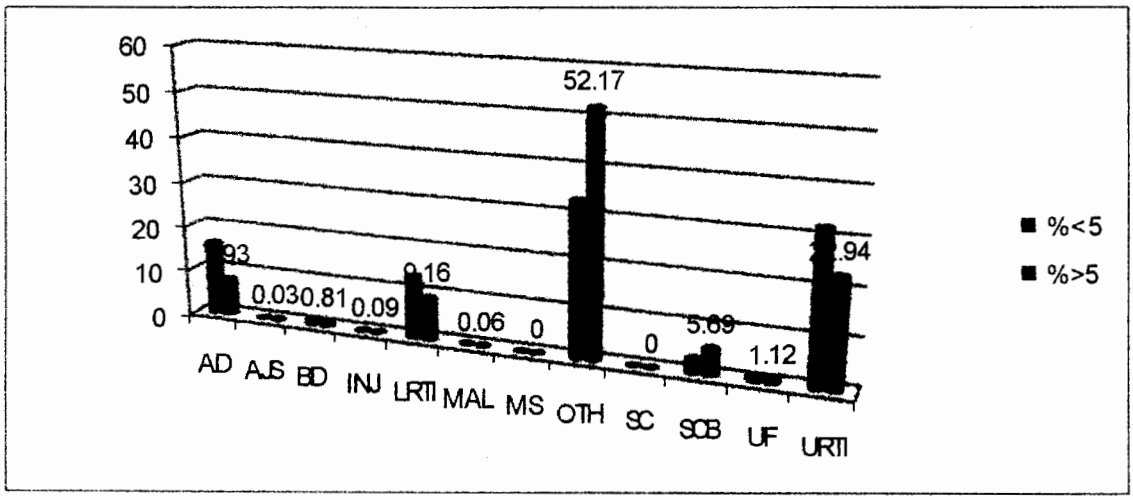

Fig-4.10: Age Wise Total Consultations from July 2007 to July 2009

Chapter 5

CONCLUSIONS AND RECOMENDATIONS

5.1 Conclusions

- Most of the water sources are at good health (springs) in AJ&K.
- High levels of turbidity and pH in water samples of a number of UCs can lead to some serious problem to fresh water ecology and associated human population.
- Bacteriological contamination is evident in all water sources.
- Turbidity of most of the samples suggested poor water quality that can be detrimental to fresh water ecosystem of sources. Moreover, high turbidity levels can be problematic when water of such sources has to be disinfected with U.V radiation and by chlorine.
- With few exceptions, no significant variation in water quality parameters was observed. It suggested that most of the water supply schemes were at good condition and no significant input of chemical contaminants was observed in water ways from source.
- Usually all of the WSS's were unprotected and unfenced from natural and anthropogenic contamination.
- Most of the population used untreated water for drinking purposes from sources.
- Water born diseases are common and infected a huge number of people in study area.
- Negligible health problems were observed in those people who used boiled water for drinking.
- Some viral infections (hepatitis, polio) were also experienced.

5.2 Recommendations

- It is recommended to adapt disinfection measures such as boiling, chlorination, and use of direct sun light at domestic level for the water contaminated only with bacteria.
- Vaccination should be done to control viral disease and infections.
- It is recommended to use Alum for that water where turbidity is high.
- Need of proper filtration or sedimentation practices to remove particulate material.
- Regular monitoring of water at sources and supply networks should be done.
- Water sources should be protected from mixing human and animal wastes.
- It is recommended that separate water points for livestock need to be developed so that the contamination due to livestock wastes be avoided in the drinking water used by the human being.
- Near every village, separate points for washing clothes and household utensils should be constructed; so that contamination due to soap and detergent could be avoided.
- Water sources like springs should be fenced, and they should be higher than walk ways paths so that livestock excreta and other wastes could be avoided in drinking water.
- Promotion of piped water supply in the villages.
- Quantitative and qualitative monitoring of water in supply schemes with reference to bacteria should be initiated as early as possible.
- The uncontrolled use of fertilizers and pesticides should be discouraged.
- To generate awareness about the water born diseases.
- To generate a culture having attitude towards safe drinking water.

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14	Jabba	Colorless	0.75	8.2	105.05	191	+ve	NTC	1967	8 sec	Y	Y	N	Y	Y	Y
15	Jurgi	Colorless	1.51	8.2	49.5	90	+ve	NTC	1740	8 sec	Y	Y	N	Y	Y	Y
16	Kalas	Turbid	9.3	7.5	46.2	84	+ve	0	1551	40 sec	Y	Y	N	Y	Y	Y
17	Kals	Colorless	3.57	7.4	44	80	+ve	NTC	1418	2 min	Y	Y	N	Y	Y	Y
18	Katha Chugali Upper	Colorless	1.51	8.2	49.5	90	+ve	NTC	1740	8 sec	Y	Y	N	Y	Y	Y
19	Katha Chugalli Lower	Colorless	0.48	8.1	41.8	76	+ve	15	2503	16 sec	Y	Y	Y	Y	Y	Y
20	Katha Sumari	Colorless	0.4	8.2	48.4	88	+ve	9	1131	4 sec	Y	Y	N	Y	Y	Y
21	Katha Sumari	Colorless	3.57	7.4	44	80	+ve	NTC	1418	2 min	Y	Y	N	Y	Y	Y
22	Kundain	Colorless	1.34	8.3	41.25	75	+ve	22	2204	16 sec	Y	Y	N	Y	Y	Y
23	Malkan Wali	Colorless	1.35	8.4	33	60	+ve	0	2564	30 sec	Y	Y	Y	Y	Y	Y
24	Mirpura	Colorless	0.24	8.4	87.45	159	+ve	5	1355	1 sec	Y	Y	N	Y	Y	Y
25	Nullah	Colorless	0.81	8.1	156.75	285	+ve	5	1925	8 sec	Y	Y	N	Y	Y	Y
26	Nullah (Nallah Jhagi)	Colorless	1.25	8.3	154.55	281	+ve	3	1216	2 sec	Y	N	N	Y	Y	Y
27	Nullah Kassi	Turbid	5.81	8.2	125.95	229	+ve	15	1458	33 sec	Y	Y	N	Y	Y	Y
28	PattiMachawa	Colorless	0.29	7.9	41.25	75	+ve	12	2048	11 sec	Y	Y	Y	Y	Y	Y
29	Perney Khass	Colorless	0.24	8.4	87.45	159	+ve	5	1355	1 sec	Y	Y	N	Y	Y	Y
30	Ratta Pani	Colorless	0.15	7.3	129.25	235	+ve	NTC	1754	5 sec	Y	Y	N	Y	Y	Y
31	Rayali	Colorless	2.1	7.5	49.5	90	+ve	10	1716	5 sec	Y	Y	N	Y	Y	Y
32	Seeri	Colorless	3.35	8.2	99	180	+ve	1	1381	30 sec	Y	Y	N	Y	Y	Y
33	Tilpattra	Colorless	0.15	7.3	129.25	235	+ve	NTC	1754	5 sec	Y	Y	N	Y	Y	Y

34	Turban Khass	Colorless	0.24	8.4	87.45	159	+ve	5	1355	1 sec	Y	Y	N	Y	Y	Y
35	Ucher	Colorless	0.21	7.9	99.55	181	+ve	NTC	1345	18 sec	Y	Y	N	Y	N	Y
36	Upper Chitticlan	Colorless	0.42	7.8	114.4	208	+ve	2	1601	7 sec	Y	Y	N	Y	Y	Y

Note; At U.C Bharian sample no 16 & 27 are turbid (9.3 & 5.81). Sample no 6, 8,12,13,16 & 23 doesn't show the presence of *E.Coli*

Abbreviation:

E.C=Electric Conductivity, pH=Power of Hydrogen, TDS=Total Dissolved Solid, +ve=Positive, NTC= Not to be count, WSS= Water Supply Scheme, Sec=Second

Table 2: Physico-chemical characterization of water samples and specific indicator of WSS of UC Sharda

Water Quality Parameters											Specific diagnostic indicators for assessment (Spring Source)					
Sr #	Name of WSS	Color	Turbidity	pH	TDS	EC	Coli-forms	E-Coli	Altitude in meters	Source Discharge (per 10 liter)	Human, animal or bird excreta contaminating with in 10-15m around the spring? (Y/N)	Spring source is un-protected and is at risk of contamination? (Y/N)	Any stagnant water around the source? (Y/N)	Is the area around the spring is unfenced? (Y/N)	Can animals have the access to with in 10m of the spring source? (Y/N)	Does spring lack protection from surface run-off? (Y/N)
37	Seeri	Colorless	0.11	8.6	56.1	102	+ve	11	2235	10 sec	N	Y	N	Y	Y	N

Note: At U C Sharda sample no 37 have high value of pH (8.6).

Abbreviation:

E.C=Electric Conductivity, pH=Power of Hydrogen, TDS=Total Dissolved Solid, +ve=Positive, NTC= Not to be count, WSS= Water Supply Scheme, Sec=Second

Table 3: Physico-chemical characterization of water samples and specific indicator of WSS of UC Doodhnayal

Water Quality Parameters											Specific diagnostic indicators for assessment (Spring Source)					
Sr #	Name of WSS	Color	Turbidity	pH	TDS	EC	Coli-forms	E-Coli	Altitude in meters	Source Discharge (per 10 liter)	Human, animal or bird excreta contaminating with in 10-15m around the spring? (Y/N)	Spring source is un-protected and is at risk of contamination? (Y/N)	Any stagnant water around the source? (Y/N)	Is the area around the spring is unfenced? (Y/N)	Can animals have the access to with in 10m of the spring source? (Y/N)	Does spring lack protection from surface run-off? (Y/N)
38	Markaz Sobai	Colorless	0.56	8.3	163.35	297	+ve	9	2178	2.10 sec	Y	N	N	Y	Y	N
39	Naka Dosost	Colorless	0.37	8	149.05	271	+ve	3	2032	30 sec	Y	N	N	Y	Y	N
40	Khallara	Colorless	2.12	8.6	154	280	+ve	4	2308	3 sec	Y	Y	N	Y	Y	Y
41	Khawaja Mollah	Colorless	0.81	8.4	136.95	249	+ve	17	2163	10 sec	Y	Y	N	Y	Y	Y
42	Markazy Shakupura	Colorless	4.08	8.8	124.3	226	+ve	NTC	1930	30 sec	Y	Y	N	Y	Y	Y
43	Seri Bala	Colorless	0.09	8.3	188.67	331	+ve	7	2222	58 sec	Y	Y	N	Y	Y	Y

Note; At U.C Dhoonayal sample no 40 & 42 have high value of pH (8.6 and 8.8 respectively)

Abbreviation;

E.C=Electric Conductivity, pH=Power of Hydrogen, TDS=Total Dissolved Solid, +ve=Positive, NTC= Not to be count, WSS= Water Supply Scheme, Sec=Second

Table 4: Physico-chemical characterization of water samples and specific indicator of WSS of UC Kail

Water Quality Parameters											Specific diagnostic indicators for assessment (Spring Source)					
Sr #	Name of WSS	Color	Turbidity	pH	TDS	EC	Coli-forms	E-Coli	Altitude in meters	Source Discharge (per 10 liter)	Human, animal or bird excreta contaminating with in 10-15m around the spring? (Y/N)	Spring source is un-protected and is at risk of contamination? (Y/N)	Any stagnant water around the source? (Y/N)	Is the area around the spring is unfenced? (Y/N)	Can animals have the access to with in 10m of the spring source? (Y/N)	Does spring lack protection from surface run-off? (Y/N)
44	Maidan	Colorless	0.72	8.5	16.5	30	+ve	0	2328	Not countable	Y	Y	N	Y	Y	Y

Note; At U.C Kail sample no 44 have no *E.Coli*

Abbreviation;

E.C=Electric Conductivity, pH=Power of Hydrogen, TDS=Total Dissolved Solid, +ve=Positive, NTC= Not to be count, WSS= Water Supply Scheme, Sec=Second

Table 5: Physico-chemical characterization of water samples and specific indicator of WSS of UC Shah Kot

Water Quality Parameters											Specific diagnostic indicators for assessment (Spring Source)					
Sr #	Name of WSS	Color	Turbidity	pH	TDS	EC	Coli-forms	E-Coli	Altitude in meters	Source Discharge (per 10 liter)	Human, animal or bird excreta contaminating with in 10-15m around the spring? (Y/N)	Spring source is un-protected and is at risk of contamination? (Y/N)	Any stagnant water around the source? (Y/N)	Is the area around the spring is unfenced? (Y/N)	Can animals have the access to with in 10m of the spring source? (Y/N)	Does spring lack protection from surface run-off? (Y/N)
45	Batangi	Non Objectionable	1.16	8.2	53.9	98	+ve	TNC	1786	2.40 min	Y	N	N	Y	N	Y
46	Chora	Colorless	0.12	8	32.45	59	+ve	25	2269	17 sec	Y	Y	N	Y	Y	Y
47	Chota Kathan Peeran	Colorless	0.9	8.1	92.4	168	+ve	TNC	1851	16 sec	Y	N	N	Y	Y	Y
48	Durmnar Lala	Colorless	2.3	7.9	48.4	88	+ve	0	2278	5 sec	Y	Y	N	Y	Y	Y
49	Jeeng Kathan Peeran	Colorless	0.18	8	92.4	168	+ve	TNC	2124	53 sec	Y	Y	Y	Y	Y	Y
50	Karashi	Colorless	0.64	8.5	26.95	49	+ve	20	2150	8 sec	Y	Y	N	Y	Y	Y
51	Katha Peeran Chunj	Colorless	0.12	7.9	63.25	115	+ve	0	1981	14 sec	Y	Y	N	Y	Y	Y
52	Kathan Peeran Ketal	Colorless	2.58	8	42.9	78	+ve	30	1772	10 sec	Y	Y	Y	Y	Y	Y
53	Kital Khata Pharian	Turbid	6.34	8.1	107.25	195	+ve	10	1853	34 sec	Y	Y	N	Y	Y	Y
54	Lala Dayniath	Colorless	0.42	7.3	112.2	204	+ve	0	1533	3.30 sec	Y	Y	N	Y	Y	Y
55	Lala Nagni, Biala & Bari	Colorless	1.1	7.9	56.1	102	+ve	TNC	2088	20 sec	Y	Y	N	Y	Y	Y

56	Palary Bala	Colorless	1.9	8.2	33	60	+ve	17	1438	9 sec	Y	Y	N	Y	Y	Y
57	Pinajian Lala	Colorless	0.33	8	57.2	104	+ve	10	2090	10 sec	Y	Y	N	Y	Y	Y
58	Rawata Bala	Colorless	1.06	8.2	130.9	238	+ve	TNC	1708	50 sec	Y	Y	N	Y	Y	Y
59	Rawata Shinga no1	Colorless	0.79	8	88	160	+ve	0	1851	40 sec	Y	Y	N	Y	Y	Y
60	Rawta Hotter	Colorless	2.1	8.1	69.3	126	+ve	10	1921	5 sec	Y	Y	N	Y	Y	Y
61	Rawta Lower	Colorless	0.81	8	86.9	158	+ve	0	1714	13 sec	Y	Y	Y	Y	Y	Y
62	Salkhala	Colorless	0.58	7.9	304.2	507	+ve	26	1637	12 sec	Y	Y	Y	Y	Y	Y
63	Selkhala Derbago Bala	Colorless	4.36	7.8	121.55	221	+ve	10	1508	10 sec						
64	Selkhala Derbago Lower	Colorless	4.36	7.8	121.55	221	+ve	10	1508	10 sec						

Note; At U.C Bharian sample no 53 are slightly turbid (6.34). Sample no 48, 51, 54, 59 and 61 doesn't show the presence of *E.Coli*

Abbreviation:

E.C=Electric Conductivity, pH=Power of Hydrogen, TDS=Total Dissolved Solid, +ve=Positive, NTC= Not to be count, WSS= Water Supply Scheme, Sec=Second

Annexure B: Water Supply Scheme Location, Management and Scheme Type

Table 1: Water Supply Scheme Location, Management and Scheme Type of UC Bharian

Scheme Location					Water Management			Scheme Type			
Sr #	Name of WSS	UC Barian	Date of Survey	Village	WMC Exists (Y/N)	Tele phone # of WMC contact person	O&M responsibility	Spring box is developed (Y/N)	Infiltration gallery is developed (Y/N)	Source is fenced (Y/N)	Is the source protected from flood diversion ditch (Y/N)
1	Danna	Barian	18/7/2009	Challayana	Yes		CBO	Y	Y	N	Y
2	Falakhan	Barian	19/7/2009	Mir Pura	Yes		CBO	N	N	N	Y
3	Moorian	Barian	17/7/2009	Challayana	Yes	0343-2456610	CBO	N	N	N	Y
4	Saidpura	Barian	18/7/2009	Barian	Yes	05882-1459214	CBO	Y	N	N	Y
5	Barian Jabbar	Barian	18/7/2009	Barian	Yes	05882-1459214	CBO	N	N	N	N
6	Bugnar	Barian	18/7/2009	Barian	Yes		CBO	N	N	N	N
7	Challi Bala	Barian	17/7/2009	Challi	Yes		CBO	Y	N	N	N
8	Challi Lower	Barian	18/7/2009	Challi	Yes		CBO	N	N	N	N
9	Chalyana Dalla	Barian	18/7/2009	Challayana	Yes		CBO	N	N	N	N
10	Charri (Chari Chugal)	Barian	17/7/2009	Katha Chaugly	Yes		CBO	N	N	N	N
11	Chitticlan Lower	Barian	17/7/2009	Challayana	Yes	0321-9042540	CBO	N	N	N	N
12	Doong	Barian	16/7/2009	Barian	Yes	0343-2456610	CBO	N	N	N	N

13	Garther	Barian	16/7/2009	Machwa Chogalli	Yes	0343-2456610	CBO	N	N	N	N
14	Jabba	Barian	17/7/2009	Challayana	Yes		CBO	N	N	N	N
15	Jurgi	Barian	17/7/2009	Katha Chaugly	Yes	0343-9567250	CBO	N	N	N	N
16	Kalas	Barian	17/7/2009	Katha Chaugly	Yes		CBO	N	N	N	N
17	Kals	Barian	17/7/2009	Katha Chaugly	Yes		CBO	Y	N	N	N
18	Katha Chugali Upper	Barian	17/7/2009	Katha Chaugly	Yes	0343-9567250	CBO	N	N	N	N
19	Katha Chugalli Lower	Barian	16/7/2009	Katha Chaugly	Yes	0343-2656610	CBO	N	N	N	N
20	Katha Sumari	Barian	18/7/2009	Semari	Yes	05882-1459214	CBO	N	N	N	N
21	Katha Sumari	Barian	17/7/2009	Semari	Yes		CBO	Y	N	N	N
22	Kundain	Barian	16/7/2009	Katha Chaugly	Yes		CBO	N	N	N	N
23	Malkan Wali	Barian	16/7/2009	Barian	Yes	0343-2456610	CBO	N	N	N	N
24	Mirpura	Barian	18/7/2009	Challayana	Yes	05821-459066	CBO	N	N	N	N
25	Nullah	Barian	18/7/2009	Challayana	Yes		CBO	N	N	N	N
26	Nullah (Nallah Jhagi)	Barian	18/7/2009	Challayana	Yes	0312-9008460	CBO	Y	N	N	N
27	Nullah Kassi	Barian	17/7/2009	Challayana	Yes		CBO	N	N	N	N
28	PattiMachawa	Barian	16/7/2009	Katha Chaugly	Yes	0343-2456610	CBO	N	N	N	N
29	Perney Khass	Barian	18/7/2009	Parney	Yes	05821-459066	CBO	N	N	N	N
30	Ratta Pani	Barian	18/7/2009	Jabbar Burhoa	Yes	05882-1459214	CBO	N	N	N	N
31	Rayali	Barian	17/7/2009	Katha Chaugly	Yes		CBO	N	N	N	N
32	Seeri	Barian	18/7/2009	Barian	Yes	05882-1459214	CBO	N	N	N	N
33	Tilpattra	Barian	18/7/2009	Jabbar Burhoa	Yes	05882-1459214	CBO	N	N	N	N

34	Turban Khass	Barian	18/7/2009	Tarbun	Yes	05821-459066	CBO	N	N	N	N
35	Ucher	Barian	18/7/2009	Challyana	Yes	0314-5733492	CBO	N	N	N	N
36	Upper Chitticlan	Barian	17/7/2009	Challyana	Yes	0321-9042540	CBO	N	N	N	N

Abbreviation:
WSS= Water Supply Scheme, WMC= Water maintenance committee, O&M=Operation and Maintenance, CBO=Community Based Organization

Table 2: Water Supply Scheme Location, Management and Scheme Type of UC Sharda

Scheme Location					Water Management			Scheme Type			
Sr #	Name of WSS	UC Sharda	Date of Survey	Village	WMC Exists (Y/N)	Tele phone # of WMC contact person	O&M responsibility	Spring box is developed (Y/N)	Infiltration gallery is developed (Y/N)	Source is fenced (Y/N)	Is the source protected from flood diversion ditch (Y/N)
37	Seeri	Sharda	19/7/2009	Kuttan	Yes	05821-455240	CBO	N	N	N	Y

Abbreviation:
WSS= Water Supply Scheme, WMC= Water maintenance committee, O&M=Operation and Maintenance, CBO=Community Based Organization

Table 3: Water Supply Scheme Location, Management and Scheme Type of UC Doodhnayal

Scheme Location					Water Management			Scheme Type			
Sr #	Name of WSS	UC Doodhnayal	Date of Survey	Village	WMC Exists (Y/N)	Tele phone # of WMC contact person	O&M responsibility	Spring box is developed (Y/N)	Infiltration gallery is developed (Y/N)	Source is fenced (Y/N)	Is the source protected from flood diversion ditch (Y/N)
38	Markaz Sobai	Doodhnayal	16/7/2009	Sobai	Yes		CBO	Y	N	N	Y
39	Naka Dosost	Doodhnayal	16/7/2009	Chalina Jagir	Yes		CBO	Y	N	N	Y
40	Khallara	Doodhnayal	16/7/2009	Khallara	Yes		CBO	N	N	N	N
41	Khawaja Mollah	Doodhnayal	16/7/2009	Dosost	Yes		CBO	N	N	N	N
42	Markazy Shakupura	Doodhnayal	16/7/2009	Batangi (Shakupura)	Yes		WMC	N	N	N	N
43	Seri Bala	Doodhnayal	16/7/2009	Barian	Yes		CBO	N	N	N	N

Abbreviation:

WSS= Water Supply Scheme, WMC= Water maintenance committee, O&M=Operation and Maintenance, CBO=Community Based Organization

Table 4: Water Supply Scheme Location, Management and Scheme Type of UC Kail

Scheme Location					Water Management			Scheme Type			
Sr #	Name of WSS	UC Kail	Date of Survey	Village	WMC Exists (Y/N)	Tele phone # of WMC contact person	O&M responsibility	Spring box is developed (Y/N)	Infiltration gallery is developed (Y/N)	Source is fenced (Y/N)	Is the source protected from flood diversion ditch (Y/N)
44	Maidan	Kail	20/7/2009	Kail Maidan	Yes	05821-457203	CBO	N	N	N	N

Abbreviation:

WSS= Water Supply Scheme, WMC= Water maintenance committee, O&M=Operation and Maintenance, CBO=Community Based Organization

Table 5: Water Supply Scheme Location, Management and Scheme Type of UC Shah Kot

Scheme Location					Water Management			Scheme Type			
Sr #	Name of WSS	UC Shah Kot	Date of Survey	Village	WMC Exists (Y/N)	Tele phone # of WMC contact person	O&M responsibility	Spring box is developed (Y/N)	Infiltration gallery is developed (Y/N)	Source is fenced (Y/N)	Is the source protected from flood diversion ditch (Y/N)
45	Batangi (Shah Kot)	Shah Kot	19/7/2009	Laswa	Yes	05821-459017	WMC	Y	N	N	N
46	Chora	Shah Kot	19/7/2009	Laswa	Yes	05821-456277	WMC	N	N	N	N
47	Chota Kathan Peeran	Shah Kot	18/7/2009	Katha Peeran	Yes		CBO	Y	N	Y	N
48	Durmnar Lala	Shah Kot	16/7/2009	Durmnar Lala	Yes		WMC	N	N	N	N
49	Jeeng Kathan Peeran	Shah Kot	18/7/2009	Katha Peeran	Yes	0312-9047978	WMC	N	N	N	N
50	Karashi	Shah Kot	16/7/2009	Donger	Yes	05821-456212	WMC	N	N	N	N
51	Katha Peeran Chunj	Shah Kot	18/7/2009	Shahkot	Yes		CBO	N	N	N	N
52	Kathan Peeran Ketal	Shah Kot	18/7/2009	Katha Peeran	Yes	0312-9047978	WMC	N	N	N	N
53	Kital Khata Pharian	Shah Kot	18/7/2009	Katha Peeran	Yes		CBO	N	N	N	N
54	Lala Dayniath	Shah Kot	16/7/2009	Lala Dayniath	Yes	05821-456212	WMC	N	N	N	N
55	Lala Nagni, Biala & Bari	Shah Kot	16/7/2009	Lala	Yes	05821-456170	WMC	N	N	N	N
56	Palary Bala	Shah Kot	18/7/2009	Palary	Yes	05821-920053	WMC	N	N	N	N
57	Pinajian Lala	Shah Kot	16/7/2009	Pinajian Lala	Yes		WMC	N	N	N	N
58	Rawata Bala	Shah Kot	17/7/2009	Rawta Bala	Yes	05821-456617	WMC	N	N	N	N

59	Rawata Shinga no1	Shah Kot	17/7/2009	Rawta	Yes	05821-456618	WMC	N	N	N	N
60	Rawta Hotter	Shah Kot	17/7/2009	Rawta	Yes	05821-456618	WMC	N	N	N	N
61	Rawta Lower	Shah Kot	17/7/2009	Rawta Lower		05821-456617	WMC	N	N	N	N
62	Salkhala	Shah Kot	16/7/2009	Shahkot	Yes	05821-1456584	WMC	N	N	N	N
63	Selkhala Derbago Bala	Shah Kot	18/7/2009	Salkhala	Yes	05821-455082	WMC	N	N	N	N
64	Selkhala Derbago Lower	Shah Kot	18/7/2009	Salkhala	Yes	05821-455082	WMC	N	N	N	N

Abbreviation:

WSS= Water Supply Scheme, WMC= Water maintenance committee, O&M=Operation and Maintenance, CBO=Community Based Organization

Annexure C: Description of Questionnaire survey in District Neelum

Health Status of Family Members During Past One Year

U.C	S.No	Name	Sex	Age	Type of Disease	Source / Reason	Duration of Disease	Repeated	Hospitalize Yes/No	Use of Boiled Water/ Non Boiled
	1									
	2									
	3									
	4									
	5									

Diseases: **1. Diarrhea and Dysentery, 2. Cholera (Heza) 3. Typhoid 4. Skin Infection 5.Eyes Infection**

6. Hepatitis 7. Intestinal Worms 8. GIT Infection (stomach infection) 9. Kidney Infection 10. Cancer

The questionnaire had following different questions relating to last one year:

1. What is age and sex composition of each family member from the elder one to younger?
2. What is the total number of family members?

3. Which type of water born diseases (Diarrhea and Dysentery, Cholera, Typhoid, Skin Infection, Eyes Infection, Hepatitis, Intestinal Worms, GIT Infection, Kidney Infection) faced by the family from past one year?
4. How many days the patient suffered from illness?
5. Either the disease is due to poor/improper food, water born or caused by some other reason?
6. During the last one year how many times each person of the family suffered from water born disease?
7. The treatment was done traditionally or used medicinal?
8. Either the disease is due to poor/improper food, water born or caused by some other reason?
9. During the last one year how many times each person of the family suffered from water born disease?
10. The treatment was done traditionally or used medicinal?
11. Whether any of the patients who suffered from water born disease was hospitalized in severe condition?
12. How many times the patient admitted in hospital and for how long time?
13. Does the water born diseases repeated in last year?
14. What is the source of water used by them for drinking?
15. Either they drink boiled water or not?

Annexure D: Type and Repetition of Diseases and use of Boiled Water

Table 1: Type and Repetition of Diseases and use of boiled water in all age group of UC Bharian

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Ints Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeatd (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-20	8	6	3	1	4	2	0	7	4	0	3	30	3		0	0
2	Prof-21	10	9	4	1	3	3	0	9	9	0	6	44	0		0	0
3	Prof-22	5	4	2	0	3	3	0	3	5	0	2	22	6.2		0	0
4	Prof-23	10	9	2	0	2	3	0	4	4	0	4	28	4.87		0	0
5	Prof-24	7	6	5	0	3	2	0	5	7	0	7	35	5.28		0	0
6	Prof-30	19	17	11	2	3	4	0	7	15	1	12	72	4.35		0	0
7	Prof-31	11	7	0	0	1	2	0	1	5	0	5	21	3.12		0	0
8	Prof-32	18	11	3	0		3	0	1	9	1	12	40	3.6		0	0
9	Prof-33	8	8	5	2	8	2	1	6	2	0	5	39	5.25		0	0
10	Prof-34	2	2	2	0	2	0	0	0	2	0	2	10	5.5		1	0
11	Prof-37	22	18	13	0	17	18	1	11	18	1	13	110	6.37	82.32/20	0	0
12	Prof-114	12	11	11	1	9	10	1	6	5	6	10	70	4.08		0	0
13	Prof-115	3	3	1	0	2	2	1	0	3	0	0	12	2		0	0
14	Prof-116	7	3	1	0	1	1	0	0	2	0	2	10	6		0	0
15	Prof-117	15	15	0	0	1	0	1	7	14	1	13	52	3.06		0	0
16	Prof-118	15	15	1	0	4	4	1	14	3	0	4	46	2.26		0	0
17	Prof-119	13	3	2	1	0	0	0	1	7	1	2	17	6.1		18	0
18	Prof-120	8	3	3	8	0	1	1	0	8	0	2	26	5.87		9	0
19	Prof-121	5	4	1	0	2	0	0	2	3	0	3	15	4.75		0	0
20	Prof-122	7	2	0	0	0	0	0	0	2	0	1	5	0.66		0	0
Total		205	156	70	16	65	60	7	84	127	11	108	704	82.32	4.11	28	0
%Age of Disease			22%	10%	2%	9%	9%	1%	12%	18%	2%	15%	100%			13.65%	0%
%Age of Population)			76%	34%	8%	32%	29%	3%	41%	62%	5%	53%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 2: Type and Repetition of Diseases and use of boiled water in below 5 years of age of UC Bharian

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Intt Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeat (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling water/Non boiling Water
1	Prof-20	2	2	2	0	1	0	0	2	0	0	2	9	3		0	0
2	Prof-21	1	1	1	0	0	0	0	1	1	0	1	5	0		0	0
3	Prof-22	2	2	2	0	0	0	0	2	2	0	1	9	4.5		0	0
4	Prof-23	4	3	1	0	0	0	0	2	2	0	2	10	3.75		0	0
5	Prof-24	1	1	0	0	0	0	0	0	1	0	1	3	2		0	0
6	Prof-30	6	6	4	0	1	0	0	3	4	0	5	23	4.33		0	0
7	Prof-31	1	1	0	0	0	0	0	0	0	0	0	1	0		0	0
8	Prof-32	2	2	2	0	0	0	0	1	0	0	1	6	3		0	0
9	Prof-33	2	2	2	0	2	0	0	2	0	0	2	10	4.5		0	0
10	Prof-34	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-37	1	1	1	0	1	1	0	1	1	0	1	7	3	43.15/20=	0	0
12	Prof-114	3	3	3	0	3	2	0	3	0	0	3	17	2.66		0	0
13	Prof-115	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
14	Prof-116	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
15	Prof-117	2	2	0	0	0	0	0	2	2	0	2	8	4.5		0	0
16	Prof-118	4	4	1	0	3	0	0	4	0	0	1	13	2.25		0	0
17	Prof-119	3	2	2	0	0	0	0	1	2	0	2	9	5.66		7	0
18	Prof-120	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
19	Prof-121	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
20	Prof-122	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
Total		35	32	21	0	11	3	0	24	15	0	24	130	43.15	2.15	7	0
%Age of Disease			25%	16%	0%	8%	2%	0%	18%	12%	0%	18%	100%			20%	0%
%Age of Population)			91%	60%	0%	31%	9%	0%	69%	43%	0%	69%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 3: Type and Repetition of Diseases and use of boiled water in 5- 15 years of age of UC Bharian

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Ints Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeard (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-20	2	1	0	0	1	0	0	1	1	0	1	5	4		0	0
2	Prof-21	4	4	2	1	1	2	0	4	4	0	2	20	0		0	0
3	Prof-22	1	1	0	0	1	1	0	1	1	0	0	5	3		0	0
4	Prof-23	1	1	0	0	0	0	0	0	0	0	1	2	3		0	0
5	Prof-24	4	4	4	0	3	2	0	3	4	0	4	24	6.25		0	0
6	Prof-30	5	5	5	0	1	0	0	4	5	0	3	23	4		0	0
7	Prof-31	4	4	0	0	1	0	0	1	4	0	4	14	3.75		0	0
8	Prof-32	5	4	1	0	0	1	0	0	2	0	4	12	3.5		0	0
9	Prof-33	2	2	2	0	2	0	0	2	0	0	2	10	4.5		0	0
10	Prof-34	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-37	3	3	3	0	3	3	0	3	3	0	3	21	2.66	75.02/20=	0	0
12	Prof-114	2	2	2	0	1	1	0	2	0	0	2	10	4.5		0	0
13	Prof-115	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
14	Prof-116	4	1	0	0	0	0	0	0	0	0	0	1	4		0	0
15	Prof-117	3	3	0	0	0	0	0	3	3	0	3	9	2.66		0	0
16	Prof-118	5	5	0	0	0	1	0	5	0	0	0	11	2.2		0	0
17	Prof-119	3	1	0	1	0	0	0	0	1	0	0	3	7		5	0
18	Prof-120	1	1	1	1	0	0	0	0	1	0	0	4	10		0	0
19	Prof-121	2	2	1	0	1	0	0	1	2	0	2	9	8		0	0
20	Prof-122	2	1	0	0	0	0	0	0	0	0	1	2	2		0	0
Total		53	45	21	3	15	11	0	30	31	0	32	185	75.02	3.75	5	0
%Age of Disease			24%	11%	2%	8%	6%	0%	16%	17%	0%	17%	102%			9.4%	0%
%Age of Population)			85%	40%	6%	28%	21%	0%	57%	58%	0%	60%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 4: Type and Repetition of Diseases and use of boiled water in above 15 years of age of UC Bharian

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Dysn Inf	Hep	Intst Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Reported (Total Rep/Total Patient)	Average Reported (Total Rep/ Total Proforma)	Preventative (Yes/No)	Use of Boiling Water/Non boiling Water
1	Prof-20	4	3	1	1	2	2	0	4	3	0	0	16	3.66		0	0
2	Prof-21	5	4	1	0	2	1	0	4	4	0	3	19	0		0	0
3	Prof-22	2	1	0	0	2	2	0	0	2	0	1	8	9.5		0	0
4	Prof-23	5	5	1	0	2	3	0	2	2	0	1	16	2.5		0	0
5	Prof-24	2	1	1	0	0	0	0	2	2	0	2	8	5		0	0
6	Prof-30	8	6	2	2	2	4	0	0	6	1	4	27	4.66		0	0
7	Prof-31	6	2	0	0	0	2	0	0	1	0	1	6	3.33		0	0
8	Prof-32	11	4	0	0		2	0	0	7	0	7	20	3.77		0	0
9	Prof-33	4	4	1	2	4	2	1	2	2	0	1	19	6		0	0
10	Prof-34	2	2	2	0	2	2	0	0	2	0	2	12	5.5		1	0
11	Prof-37	18	14	9	0	13	13	1	7	13	1	9	80	2.66	77.29/20=	0	0
12	Prof-114	7	6	6	1	5	6	1	1	5	6	5	42	5.16		0	0
13	Prof-115	3	2	1	0	2	2	1	0	3	0	0	11	2		0	0
14	Prof-116	3	2	1	0	1	1	0	0	2	0	2	9	4.66		0	0
15	Prof-117	10	10	0	0	1	0	1	2	9	1	8	32	2.9		0	0
16	Prof-118	6	6	0	0	1	3	1	5	3	0	3	22	2.33		0	0
17	Prof-119	7	0	0	0	0	0	0	0	4	1	0	5	6		6	0
18	Prof-120	7	2	2	7	0	1	1	0	7	0	2	22	6.16		9	0
19	Prof-121	3	2	0	0	1	0	0	1	1	0	1	6	1.5		0	0
20	Prof-122	4	1	0	0	0	0	0	0	2	0	0	3	0		0	0
Total		117	77	28	13	40	46	7	30	80	10	52	383	77.29	3.86	16	0
%Age of Disease			20%	7%	3%	10%	12%	2%	8%	21%	3%	14%	100%			13.67%	0%
%Age of Population)			66%	24%	11%	34%	39%	6%	26%	68%	9%	44%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 5: Type and Repetition of Diseases and use of boiled water in all age group of UC Doodhnayal

TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF DOODHNAYAL																	
			DISEASE TYPES														
S.No	Performa No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Intes Worms	GIT inf	Kidney inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/Total Performa)	Hospitalize (Yes/No)	Used of boiling Water/Non boiling Water
1	Prof-1	13	3	2	1	0	0	0	1	7	1	2	17	6.1		18	0
2	Prof-2	8	3	3	8	0	1	1	0	8	0	2	26	5.87		9	0
3	Prof-3	7	4	4	1	1	3	0	0	5	1	4	23	5.16		0	0
4	Prof-4	8	0	0	3	1	0	0	0	3	0	0	7	1.5		0	0
5	Prof-5	9	6	6	2	0	0	0	1	6	0	6	27	4.5		0	0
6	Prof-6	17	9	5	7	0	0	0	2	15	2	0	40	4.17		4	0
7	Prof-7	4	2	0	0	2	0	0	0	3	0	2	9	0.66		0	0
8	Prof-8	9	7	3	0	3	0	0	3	9	0	6	31	0		3	0
9	Prof-9	12	0	0	0	1	0	0	0	1	0	1	3	3		0	0
10	Prof-10	7	0	0	1	0	0	0	0	1	2	2	6	4		4	0
11	Prof-11	8	6	6	0	1	0	0	2	1	0	6	22	3.66	78.14/20	0	0
12	Prof-12	7	5	2	5	1	3	0	2	6	0	5	29	3.71		0	0
13	Prof-13	8	7	4	0	3	1	0	7	6	1	1	30	3		0	0
14	Prof-14	11	6	3	1	1	4	0	5	5	0	1	26	4.66		0	0
15	Prof-15	9	7	1	1	0	0	0	6	8	0	0	23	3.87		0	0
16	Prof-16	7	0	0	1	0	0	0	0	2	0	1	4	9		0	0
17	Prof-17	6	4	3		2	0	0	2	5	1	3	21	3.2		1	0
18	Prof-18	5	1	0	1	0	0	0	2	1	1	2	8	3.25		1	0
19	Prof-19	6	6	1	0	0	1	0	5	6	0	5	24	5.83		0	0
20	Prof-20	8	7	4	0	3	1	0	7	6	1	1	30	3		0	0
TOTAL		169	83	47	32	19	14	1	45	104	10	50	406	78.14	3.9	40	0
%Age of Disease			20%	12%	8%	5%	3%	0%	11%	26%	2%	12%	100%			23.6%	0%
%Age of Population)			49%	28%	19%	11%	8%	1%	27%	62%	6%	30%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 6: Type and Repetition of Diseases and use of boiled water in below 5 years of age of UC Doodhnayal

BELOW 5 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF DOODHNAYAL																	
			DISEASE TYPES														
S.No	Performa No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Intes Worm	GIT inf	Kidney inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Performa)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-1	3	2	2	0	0	0	0	1	2	0	2	9	5.66		7	0
2	Prof-2	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-3	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
4	Prof-4	2	0	0	1	0	0	0	0	1	0	0	2	3		0	0
5	Prof-5	1	1	1	0	0	0	0	1	1	0	1	5	5		0	0
6	Prof-6	4	3	2	0	0	0	0	2	2	1	0	10	4.75		0	0
7	Prof-7	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
8	Prof-8	1	1	1	0	0	0	0	1	1	0	0	4	0		0	0
9	Prof-9	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-10	0	0	0	0	0	0	0	0	0	0	0	0	0	39.74/20	0	0
11	Prof-11	2	3	3	0	0	0	0	2	0	0	3	11	3.33		0	0
12	Prof-12	1	1	1	1	0	0	0	1	1	0	1	6	3		0	0
13	Prof-13	2	2	2	0	1	0	0	2	2	0	0	9	3		0	0
14	Prof-14	1	1	0	0	0	0	0	0	0	0	1	2	2		0	0
15	Prof-15	1	1	1	0	0	0	0	1	1	0	0	4	2		0	0
16	Prof-16	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
17	Prof-17	2	2	2	0	0	0	0	2	2	0	1	9	2		0	0
18	Prof-18	1	1	0	1	0	0	0	1	0	0	1	4	1		1	0
19	Prof-19	1	1	1	0	0	0	0	1	1	0	1	5	4		0	0
20	Prof-123	1	1	0	1	0	0	0	1	0	0	1	4	1		0	0
TOTAL		25	20	16	4	1	0	0	16	14	1	12	84	39.74	1.98	8	0
%Age of Disease			24%	19%	5%	1%	0%	0%	19%	17%	1%	14%	100%			32%	0%
%Age of Population)			80%	64%	16%	4%	0%	0%	64%	56%	4%	48%					

Abbreviation: Diarr & Dysent= Diarrhoea and dysentery, Chi= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated,

Table 7: Type and Repetition of Diseases and use of boiled water in 5- 15 years of age of UC Doodhnayal

5-15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF DOODHNAYAL																	
			DISEASE TYPES														
S.No	Performa No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Intes Worm	GIT inf	Kidney inf	Fever	Total Disease	Total Reported (Total Repetition Patient)	Average Repeated (Total Rep/ Total Performa)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-1	4	1	0	1	0	0	0	0	1	0	1	4	6	69.32/20	5	0
2	Prof-2	2	1	1	1	0	0	0	0	1	0	0	4	10		0	0
3	Prof-3	3	3	3	0	0	1	0	0	3	0	3	13	7		0	0
4	Prof-4	2	0	0	0	0	0	0	0	0	0	0	0	0		0	0
5	Prof-5	2	2	2	1	0	0	0	0	2	0	2	9	2		0	0
6	Prof-6	2	2	1	0	0	0	0	0	2	0	0	5	3.5		0	0
7	Prof-7	1	1	0	0	1	0	0	0	1	0	0	3	0		0	0
8	Prof-8	4	4	1	0	1	0	0	2	4	0	3	15	0		0	0
9	Prof-9	5	0	0	0	1	0	0	0	1	0	0	2	2		0	0
10	Prof-10	2	0	0	1	0	0	0	0	0	0	1	2	4		2	0
11	Prof-11	2	2	2	0	0	0	0	0	0	0	1	5	3.5		0	0
12	Prof-12	3	3	1	3	0	2	0	1	3	0	2	15	3.66		0	0
13	Prof-13	4	4	1	0	2	1	0	4	3	0	1	16	3.25		0	0
14	Prof-14	2	2	2	1	1	2	0	2	2	0	0	12	6		0	0
15	Prof-15	4	4	0	1	0	0	0	4	4	0	0	13	4.5		0	0
16	Prof-16	4	0	0	0	0	0	0	0	0	0	0	0	0		0	0
17	Prof-17	1	1	0	1	1	0	0	0	1	0	1	5	4		0	0
18	Prof-18	1	0	0	0	0	0	0	1	1	0	1	3	2		0	0
19	Prof-19	3	3	0	0	0	1	0	3	3	0	3	13	4.66		0	0
20	Prof-20	4	4	1	0	2	1	0	4	3	0	1	16	3.25		0	0
TOTAL		55	37	15	10	9	8	0	21	35	0	20	155	69.32	3.46	7	0
%Age of Disease			24%	10%	6%	6%	5%	0%	14%	23%	0%	13%	100%			12.7%	0%
%Age of Population)			67%	27%	18%	16%	15%	0%	38%	64%	0%	36%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid; inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 8: Type and Repetition of Diseases and use of boiled water in above 15 years of age of UC Doodhnayal

ABOVE 15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF DOODHNAYAL																	
			DISEASE TYPES														
S.No	Performa No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Int. Worm	GIT inf	Kidney inf	Fever	Total Disease	Total Reported (Total Rep/Total Patient)	Average Repeated (Total Rep/Total Performa)	Hospitalize (Yes/No)	Use of Boiling Water/Non boiling Water
1	Prof-1	4	0	0	0	0	0	0	0	4	1	0	5	6	79.85/20	6	0
2	Prof-2	2	2	2	7	0	1	1	0	7	0	2	22	6.16		9	0
3	Prof-3	3	1	1	1	1	2	0	0	2	1	1	10	3.33		0	0
4	Prof-4	2	0	0	2	1	0	0	0	2	0	0	5	1		0	0
5	Prof-5	2	3	3	1	0	0	0	0	3	0	2	12	4.5		0	0
6	Prof-6	2	4	2	7	0	0	0	0	11	1	0	25	4.54		4	0
7	Prof-7	1	1	0	0	1	0	0	0	2	0	2	6	1		0	0
8	Prof-8	4	2	1	0	2	0	0	0	4	0	3	12	0		3	0
9	Prof-9	5	0	0	0	0	0	0	0	0	0	1	1	4		0	0
10	Prof-10	2	0	0	0	0	0	0	0	1	2	1	4	0		2	0
11	Prof-11	2	1	1	0	1	0	0	0	1	0	2	6	2.5		0	0
12	Prof-12	3	1	0	1	1	1	0	0	2	0	2	8	4		0	0
13	Prof-13	4	1	1	0	0	0	0	1	1	1	0	5	2		0	0
14	Prof-14	2	3	1	0	0	2	0	3	3	0	0	12	4.66		0	0
15	Prof-15	4	1	0	0	0	0	0	1	3	0	0	5	3.66		0	0
16	Prof-16	4	0	0	1	0	0	0	0	2	0	1	4	9		0	0
17	Prof-17	1	1	1	0	1	0	0	0	2	1	1	7	4		1	0
18	Prof-18	1	0	0	0	0	0	0	0	0	1	0	1	10		0	0
19	Prof-19	3	2	0	0	0	0	0	1	2	0	1	6	8.5		0	0
20	Prof-20	4	1	1	0	0	0	0	1	1	1	0	5	1		0	0
TOTAL		55	24	14	20	8	6	1	7	53	9	19	161	79.85	3.99	25	0
%Age of Disease			15%	9%	12%	5%	4%	1%	4%	33%	6%	12%	100%			45.5%	0%
%Age of Population)			44%	25%	36%	15%	11%	2%	13%	96%	16%	35%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 9: Type and Repetition of Diseases and use of boiled water in all age group of UC Kail

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Ints Worm	GIT inf	Kidny inf	Others	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeatd (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-99	15	15	1	0	4	4	1	14	3	0	4	46	2.26		0	0
2	Prof-100	6	0	0	0	0	0	0	0	1	0	0	1	5		0	0
3	Prof-101	11	9	0	0	1	1	0	0	2	0	5	18	2.33		0	0
4	Prof-102	15	3	0	0	3	1	0	1	0	0	2	10	0		0	0
5	Prof-103	13	3	3	0	0	2	0	0	1	0	3	12	1.75		0	0
6	Prof-104	7	5	1	1	2	3	0	0	0	0	3	15	1		0	0
7	Prof-105	8	0	0	0	1	2	0	0	3	0	0	6	0		0	0
8	Prof-106	11	7	0	0	2	1	0	0	0	0	5	15	3.66		0	0
9	Prof-107	5	0	0	0	0	0	0	0	1	0	0	1	4		0	0
10	Prof-108	13	0	0	0	0	0	0	0	1	0	0	1	5		0	0
11	Prof-109	20	4	0	0	2	0	0	0	3	0	9	18	0		0	0
12	Prof-110	17	6	0	0	3	1	0	0	1	4	8	23	2		0	0
13	Prof-111	9	0	0	0	0	1	0	0	1	0	0	2	2		0	0
14	Prof-112	9	1	0	0	0	0	0	0	1	0	0	2	5		0	0
15	Prof-113	13	12	1	0	2	0	0	0	1	0	11	27	2		0	0
16	Prof-124	6	6	6	0	1	5	0	0	5	3	5	31	4.83		1	0
17	Prof-125	13	2	0	0	1	0	0	0	0	0	0	3	0		0	13
18	Prof-126	7	7	2	3	7	7	0	3	3	2	7	41	2.28		1	0
19	Prof-127	6	6	5	3	3	0	0	2	1	0	3	23	3.5		6	0
20	Prof-128	11	2	0	0	1	2	0	1	6	1	...	13	2.37	48.98/20	1	0
TOTAL		215	88	19	7	33	30	1	21	34	10	65	308	48.98	2.449	9	13
%Age of Disease			29%	6%	2%	11%	10%	0%	7%	11%	3%	21%	100%			4%	6%
%Age of Population)			41%	9%	3%	15%	14%	0%	10%	16%	5%	30%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 10: Type and Repetition of Diseases and use of boiled water in below 5 years of age of UC Kail

			DISEASE TYPES													
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin Inf	Eyes Inf	Hep	Infs Worm	GIT inf	Kidny Inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeat (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-99	4	4	1	0	3	0	0	4	0	0	1	13	9		0	0
2	Prof-100	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-101	3	3	0	0	0	0	0	0	0	0	1	4	6		0	0
4	Prof-102	2	2	0	0	0	0	0	0	0	0	2	4	0		0	0
5	Prof-103	2	1	1	0	0	0	0	0	0	0	1	3	2		0	0
6	Prof-104	2	2	1	0	1	0	0	0	0	0	1	5	2		0	0
7	Prof-105	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
8	Prof-106	3	3	0	0	1	0	0	0	0	0	3	7	12		0	0
9	Prof-107	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-108	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-109	3	3	0	0	0	0	0	0	0	0	3	6	0		0	0
12	Prof-110	4	3	0	0	0	0	0	0	0	1	4	8	6		0	0
13	Prof-111	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
14	Prof-112	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
15	Prof-113	1	1	0	0	0	0	0	0	0	0	11	12	2		0	0
16	Prof-124	1	1	1	0	0	1	0	0	1	0	1	5	15		0	0
17	Prof-125	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
18	Prof-126	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
19	Prof-127	1	1	1	0	0	0	0	0	0	0	0	2	4		0	0
20	Prof-128	2	2	0	0	0	0	0	1	0	0	2	5	2.5		0	0
TOTAL		31	26	5	0	5	1	0	5	1	1	30	74	60.5	3.02	0	1
%Age of Disease			8%	2%	0%	2%	0%	0%	2%	0%	0%	10%				0%	3%
%Age of Population)			12%	2%	0%	2%	0%	0%	2%	0%	0%	14%					

60.5/20

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 11: Type and Repetition of Diseases and use of boiled water in 5- 15 years of age of UC Kail

			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eye inf	Hep	Ith Worm	GIT inf	Kidney Inf	Fever	Total Disease	Total Repeated (Total Rep/ Total Patient)	Average Repeat (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-99	5	5	0	0	0	1	0	5	0	0	0	11	0		0	0
2	Prof-100	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-101	1	1	0	0	1	1	0	0	0	0	1	4	0		0	0
4	Prof-102	7	1	0	0	2	0	0	1	0	0	0	4	0		0	0
5	Prof-103	13	0	0	0	0	1	0	0	0	0	0	1	0		0	0
6	Prof-104	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
7	Prof-105	2	0	0	0	0	0	0	0	0	0	0	0	0		0	0
8	Prof-106	2	2	0	0	0	0	0	0	0	0	1	3	0		0	0
9	Prof-107	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-108	6	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-109	5	0	0	0	1	0	0	0	0	0	3	4	0		0	0
12	Prof-110	2	1	0	0	1	0	0	0	0	2	2	6	4		0	0
13	Prof-111	4	0	0	0	0	0	0	0	0	0	0	0	0		0	0
14	Prof-112	5	0	0	0	0	0	0	0	0	0	0	0	0		0	0
15	Prof-113	5	5	0	0	0	0	0	0	0	0	5	10	10		0	0
16	Prof-124	1	1	1	0	0	1	0	0	1	0	1	5	3		0	0
17	Prof-125	5	1	0	0	0	0	0	0	0	0	0	1	0		0	5
18	Prof-126	4	4	1	2	4	4	0	3	0	0	4	22	3		1	0
19	Prof-127	2	2	2	1	0	0	0	2	0	0	1	8	12		6	0
20	Prof-128	5	0	0	0	0	0	0	0	2	0	4	13	4	36/20	0	0
TOTAL		76	23	4	3	9	8	0	11	3	2	22	92	36	1.8	7	5
%Age of Disease			25%	4%	3%	10%	9%	0%	12%	3%	2%	24%				9%	6.6%
%Age of Population)			30%	5%	4%	12%	11%	0%	14%	4%	3%	29%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 12: Type and Repetition of Diseases and use of boiled water in above 15 years of age of UC Kail

			DISEASE TYPES														
S No	Profound No.	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eye inf	Hep	Intt Worm	GIT inf	Malar inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Rep. and (Total Rep/ Total Proforma)	Hospitalize (12 cases)	Use of boiling Water/Non boiling Water
1	Prof-99	6	6	0	0	1	3	1	5	3	0	3	22	14	100.83/20	0	0
2	Prof-100	4	0	0	0	0	0	0	0	1	0	0	1	5		0	0
3	Prof-101	7	5	0	0	0	0	0	0	2	0	3	10	11		0	0
4	Prof-102	6	0	0	0	1	1	0	0	0	0	1	3	0		0	0
5	Prof-103	5	2	2	0	0	1	0	0	1	0	2	8	5		0	0
6	Prof-104	5	3	0	1	1	3	0	0	0	0	2	10	4		0	0
7	Prof-105	6	0	0	0	1	2	0	0	3	0	0	6	0		0	0
8	Prof-106	6	2	0	0	1	1	0	0	0	0	1	5	13		0	0
9	Prof-107	5	0	0	0	0	0	0	0	1	0	0	1	4		0	0
10	Prof-108	6	0	0	0	0	0	0	0	1	0	0	1	5		0	0
11	Prof-109	12	1	0	0	1	0	0	0	3	0	3	8	0		0	0
12	Prof-110	10	1	0	0	2	1	0	0	1	0	1	6	6		0	0
13	Prof-111	5	0	0	0	0	1	0	0	1	0	0	2	2		0	0
14	Prof-112	3	1	0	0	0	0	0	0	1	0	0	2	10		0	0
15	Prof-113	7	6	1	0	2	0	0	0	1	0	5	15	12		0	0
16	Prof-124	2	2	2	0	1	2	0	0	1	2	2	12	3		1	0
17	Prof-125	7	1	0	0	1	0	0	0	0	0	0	2	0		0	7
18	Prof-126	3	3	1	1	3	3	0	0	3	2	3	19	1.33		1	0
19	Prof-127	3	3	2	2	3	0	0	0	1	0	2	13	2.5		0	0
20	Prof-128	4	0	0	0	1	2	0	1	2	1	2	9	3		1	0
TOTAL		112	36	8	4	19	20	1	6	26	5	30	155	100.83	5.04	3	7
%Age of Disease			23%	5%	3%	12%	13%	1%	4%	17%	3%	19%	100%			2.7%	6.3%
%Age of Population)			32%	7%	4%	17%	18%	1%	5%	23%	4%	27%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 13: Type and Repetition of Diseases and use of boiled water in all age group of UC Ashkot

TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF ASHKOT																	
			DISEASE TYPES														
S.No	Proforma No#.	Total Members	Diarr & Dysent.	Chl	Typh	Skin inf.	Eyes Inf.	Hep.	Intes. Worm	GIT inf.	Kidney inf.	Fever	Total Disease	Total Repeated (Total Rep/ Total Patient)	Average Repeat (Total Rep/ Total Proforma)	Hospitalize Yes/No#	Use of Boiling Water/non Boiling
1	Prof-28	7	2	2	0	0	0	0	0	0	2	0	6	0.66		0	0
2	Prof-29	10	2	2	1	1	0	1	0	0	3	2	12	2.8		0	0
3	Prof-36	4	4	4	1	0	2	4	0	1	2	0	18	4.75		0	0
4	Prof-82	5	1	1	0	1	1	0	2	1	0	0	7	0		2	5
5	Prof-83	7	5	5	1	1	0	1	1	0	0	1	15	0		2	7
6	Prof-84	7	6	6	0	2	1	1	0	0	0	0	16	0		2	7
7	Prof-85	2	2	2	0	2	1	1	0	0	0	0	8	1.5		1	2
8	Prof-86	7	1	1	0	1	1	0	0	0	0	0	4	1.57		2	7
9	Prof-87	8	0	0	0	0	0	0	0	0	0	0	0	0		0	6
10	Prof-88	1	1	1	0	0	0	0	0	0	0	0	2	0		1	0
11	Prof-89	9	0	0	0	0	0	0	0	0	0	0	0	0	14.03/20	0	9
12	Prof-90	7	0	0	0	0	0	0	0	0	0	0	0	0		0	7
13	Prof-91	12	2	2	1	2	5	5	1	5	1	0	24	0		3	6
14	Prof-92	7	0	0	0	0	0	0	0	0	0	1	1	0.25		1	7
15	Prof-93	6	1	1	1	1	0	0	0	0	0	0	4	0		1	6
16	Prof-94	7	1	1	3	1	3	2	1	1	1	1	15	0		3	0
17	Prof-95	3	1	1	0	0	0	1	0	1	0	1	5	0		1	0
18	Prof-96	3	1	1	1	1	0	0	0	0	0	0	4	0		0	3
19	Prof-97	6	0	0	0	0	1	0	0	0	0	0	1	0		1	6
20	Prof-98	6	2	2	1	0	1	0	0	0	0	0	6	2.5		0	6
Total		124	32	32	10	13	16	16	5	9	9	6	148	14.03	0.7	20	84
%Age of Disease			22%	22%	7%	9%	11%	11%	3%	6%	6%	4%	100%			16%	67.7%
%Age of Population)			26%	26%	8%	10%	13%	13%	4%	7%	7%	5%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 14: Type and Repetition of Diseases and use of boiled water in below 5 years of age of UC Ashkot

BELOW 5 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF ASHKOT																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Int Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeat (Total Rep/ Total Profatma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-28	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
2	Prof-29	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-36	0	0	0	0	0	0	0	0	0	0	0	0	0			0
4	Prof-82	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
5	Prof-83	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
6	Prof-84	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
7	Prof-85	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
8	Prof-86	1	0	0	0	1	0	0	0	0	0	1	2	3		1	1
9	Prof-87	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-88	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-89	0	0	0	0	0	0	0	0	0	0	0	0	0	3/20=	0	0
12	Prof-90	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
13	Prof-91	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
14	Prof-92	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
15	Prof-93	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
16	Prof-94	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
17	Prof-95	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
18	Prof-96	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
19	Prof-97	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
20	Prof-98	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
Total		6	0	0	0	1	0	0	0	0	0	1	2	3	0.15	1	3
%Age of Disease			0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	100%			16.6%	50%
%Age of Population)			0%	0%	0%	17%	0%	0%	0%	0%	0%	17%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 15: Type and Repetition of Diseases and use of boiled water in 5- 15 years of age of UC Ashkot

5-15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF ASHKOT																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Jats Worm	GIT inf	Kidny inf	Refer	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-28	2	1	0	0	0	0	0	0	0	0	1	2	2		0	0
2	Prof-29	3	2	1	1	0	1	0	0	0	0	0	5	3		0	0
3	Prof-36	0	0	0	0	0	0	0	0	0	0	0	0	0			0
4	Prof-82	3	0	0	1	1	0	1	0	0	0	0	3	0		0	3
5	Prof-83	1	0	1	0	0	0	0	0	0	0	0	1	0		0	1
6	Prof-84	1	1	0	1	0	0	0	0	0	0	0	2	0		0	1
7	Prof-85	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
8	Prof-86	2	0	0	1	0	0	0	0	0	0	2	3	1		0	2
9	Prof-87	3	0	0	0	0	0	0	0	0	0	0	0	0		0	3
10	Prof-88	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-89	4	0	0	0	0	0	0	0	0	0	0	0	0	8/20=	0	4
12	Prof-90	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
13	Prof-91	5	0	1	1	3	1	0	4	0	0	2	12	0		1	0
14	Prof-92	2	0	0	0	0	0	0	0	0	0	0	0	0		0	2
15	Prof-93	4	0	0	0	0	0	0	0	0	0	0	0	0		0	4
16	Prof-94	2	0	0	0	0	0	0	0	0	0	0	0	0		0	0
17	Prof-95	1	0	0	0	0	0	0	0	0	1	0	1	0		0	0
18	Prof-96	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
19	Prof-97	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
20	Prof-98	2	0	0	0	0	0	0	0	0	0	1	1	2		0	2
Total		37	4	3	5	4	2	1	4	0	1	6	30	8	0.4	1	24
%Age of Disease			13%	10%	17%	13%	7%	3%	13%	0%	3%	20%	100%			2.7%	65%
%Age of Population)			11%	8%	14%	11%	5%	3%	11%	0%	3%	16%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 16: Type and Repetition of Diseases and use of boiled water in above 15 years of age of UC Ashkot

ABOVE 15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF ASHKOT																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eye inf	Hep	Intes Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water (Yes boiling Water
1	Prof-28	4	1	0	0	0	0	0	0	2	0	1	4	0		0	0
2	Prof-29	6	0	0	1	0	0	0	0	3	2	3	9	4		0	0
3	Prof-36	4	4	1	0	2	4	0	1	2	0	3	17	4.75		0	0
4	Prof-82	2	1	0	0	0	0	1	1	0	0	0	3	0		2	2
5	Prof-83	6	5	0	1	0	1	1	0	0	1	1	10	0		2	6
6	Prof-84	6	5	0	1	1	1	0	0	0	0	0	8	0.6		2	6
7	Prof-85	2	2	0	2	1	1	0	0	0	0	0	6	1.5		1	2
8	Prof-86	4	1	0	0	0	0	0	0	0	0	4	5	1.5		1	4
9	Prof-87	3	0	0	0	0	0	0	0	0	0	0	0	0		0	3
10	Prof-88	1	1	0	0	0	0	0	0	0	0	0	1	0		1	0
11	Prof-89	5	0	0	0	0	0	0	0	0	0	0	0	0	15.25/20	0	5
12	Prof-90	5	0	0	0	0	0	0	0	0	0	0	0	0		0	5
13	Prof-91	6	2	0	1	2	4	1	1	1	0	0	12	0		2	6
14	Prof-92	4	0	0	0	0	0	0	0	0	1	3	4	0.25		1	4
15	Prof-93	2	1	1	1	0	0	0	0	0	0	1	4	0		1	2
16	Prof-94	5	1	3	1	3	2	1	1	1	1	1	15	0		3	0
17	Prof-95	2	1	0	0	0	1	0	1	0	1	0	4	0		1	0
18	Prof-96	2	1	1	1	0	0	0	0	0	0	0	3	0		0	2
19	Prof-97	6	0	0	0	1	0	0	0	0	0	0	1	0		1	6
20	Prof-98	4	2	1	0	1	0	0	0	0	0	1	5	2.66		0	4
Total		79	28	7	9	11	14	4	5	9	6	18	111	15.26	0.76	18	57
%Age of Disease			25%	6%	8%	10%	13%	4%	5%	8%	5%	16%	100%			23%	72%
%Age of Population)			35%	9%	11%	14%	18%	5%	6%	11%	8%	23%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 17: Type and Repetition of Diseases and use of boiled water in all age group of UC Sharda

TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF SHARDA																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf's	Eyes Inf	Hep	Int. Worm	GIT inf	Kidney inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient).	Average Repeat# (Total Rep/Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-35	5	4	1	0	2	0	0	2	3	0	3	15	4.75		0	0
2	Prof-36	4	4	1	0	2	4	0	1	2	0	3	17	4.75		0	0
3	Prof-38	25	16	11	0	4	6	0	0	9	5	16	67	3.52		1	0
4	Prof-39	20	15	8	2	7	5	0	4	5	1	14	61	3.07		2	0
5	Prof-40	6	3	2	1	1	1	0	0	4	2	2	16	7		4	0
6	Prof-41	16	12	4	0	1	4	0	2	7	2	10	42	3		0	0
7	Prof-42	19	16	7	1	4	4	1	7	11	7	...	58	3.12		7	0
8	Prof-43	14	13	10	2	6	2	3	2	4	3	13	58	4.07		0	0
9	Prof-44	9	0	0	0	1	0	0	0	0	2	2	5	2		0	0
10	Prof-45	6	3	1	1	2	1	0	0	1	1	6	16	5.2	73.78/20	0	0
11	Prof-46	9	2	2	0	0	0	0	1	2	1	2	10	15		1	0
12	Prof-47	6	6	6	0	6	6	0	0	2	1	6	33	4		2	0
13	Prof-48	8	6	1	1	6	5	0	0	6	1	6	32	3.43		1	0
14	Prof-49	8	0	0	0	1	1	1	0	0	1	1	5	1.5		0	8
15	Prof-50	9	7	4	0	5	1	0	0	0	0		17	2.12		0	0
16	Prof-51	7	0	0	0	0	0	0	0	1	0	0	1	1		0	7
17	Prof-52	6	0	0	0	0	0	0	0	0	0	0	0	0		0	6
18	Prof-53	8	0	0	0	0	0	0	0	0	0	0	0	0		0	8
19	Prof-54	10	8	5	6	6	6	1	9	6	0	6	53	3.33		0	0
20	Prof-55	17	15	13	1	2	9	0	1	9	7	14	71	2.92		2	2
Total		212	130	76	15	56	55	6	29	72	34	104	577	73.78	3.68	20	31
%Age of Disease			23%	13%	3%	10%	10%	1%	5%	12%	6%	18%	100%			9.4%	15%
%Age of Population)			61%	36%	7%	26%	26%	3%	14%	34%	16%	49%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 18: Type and Repetition of Diseases and use of boiled water in below 5 years of age of UC Sharda

BELOWE 5 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF SHARDA																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Intn Worm	GIT inf	Kidny Inf	Fever	Total Disease	Total Rep.ated (Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-35	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
2	Prof-36	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-38	5	5	4	0	0	1	0	0	1	0	5	16	5.4		0	0
4	Prof-39	6	4	3	0	2	0	0	3	1	0	3	16	3.25		0	0
5	Prof-40	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
6	Prof-41	1	1	0	0	0	0	0	0	1	0	1	3	4		0	0
7	Prof-42	3	3	3	1	1	0	0	1	1	0	3	13	4		1	0
8	Prof-43	3	3	3	0	1	0	0	2	0	0	3	12	2.33		0	0
9	Prof-44	1	0	0	0	0	0	0	0	0	0	1	1	2		0	0
10	Prof-45	1	1	1	0	1	0	0	0	0	0	1	4	3		0	0
11	Prof-46	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
12	Prof-47	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
13	Prof-48	1	1	1	0	1	0	0	0	0	0	1	4	3		1	0
14	Prof-49	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
15	Prof-50	4	3	3	0	2	0	0	0	0	0	4	12	2.25		0	0
16	Prof-51	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
17	Prof-52	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
18	Prof-53	1	0	0	0	0	0	0	0	0	0	0	0	0		0	1
19	Prof-54	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
20	Prof-55	3	3	3	0	0	2	0	0	1	1	3	13	3		0	0
Total		30	24	21	1	8	3	0	6	5	1	25	94	32.23	1.61	2	2
%Age of Disease			26%	22%	1%	9%	3%	0%	6%	5%	1%	27%	100%			6.6%	6.6%
%Age of Population)			80%	70%	3%	27%	10%	0%	20%	17%	3%	83%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 19: Type and Repetition of Diseases and use of boiled water in 5- 15 years of age of UC Sharda

5-15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF SHARDA																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf.	Eyes Inf	Hep	Intt. Worm	GIT inf.	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-35	2	2	1	0	0	0	0	1	2	0	2	8	8		0	0
2	Prof-36	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-38	7	5	3	0	2	2	0	2	3	2	4	23	3		0	0
4	Prof-39	3	3	3	0	1	1	0	1	0	0	3	12	2.66		0	0
5	Prof-40	4	3	2	1	0	1	0	0	3	2	1	13	10		4	
6	Prof-41	7	6	5	0	1	3	0	2	3	0	5	25	2		0	0
7	Prof-42	4	4	2	0	0	0	0	4	3	1	4	18	2.5		0	0
8	Prof-43	3	3	3	0	3	0	0	0	0	0	3	12	5.66		0	0
9	Prof-44	5	0	0	0	0	0	0	0	0	1	0	1	10		0	0
10	Prof-45	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-46	4	0	0	0	0	0	0	0	0	0	0	0	0	60.32/20	0	0
12	Prof-47	2	2	2	0	2	2	0	0	0	0	2	10	4		0	0
13	Prof-48	1	1	1	1	1	1	0	0	1	0	1	7	3		0	0
14	Prof-49	3	0	0	0	0	0	0	0	0	0	0	0	0		0	3
15	Prof-50	1	1	1	0	1	0	0	0	0	0	1	4	3		0	0
16	Prof-51	4	0	0	0	0	0	0	0	0	0	0	0	0		0	4
17	Prof-52	3	0	0	0	0	0		0	0	0	0	0	0		0	3
18	Prof-53	3	0	0	0	0	0	0	0	0	0	0	0	0		0	3
19	Prof-54	6	6	3	5	4	4	0	6	5	0	4	37	3.5		0	0
20	Prof-55	3	3	3	0	1	3	0	1	0	0	3	14	3		0	0
Total		65	39	29	7	16	17	0	17	20	6	33	184	60.32	3	4	13
%Age of Disease			21%	16%	4%	9%	9%	0%	9%	11%	3%	18%	100%			6%	20%
%Age of Population)			60%	45%	11%	25%	26%	0%	26%	31%	9%	51%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 20: Type and Repetition of Diseases and use of boiled water in above 15 years of age of UC Sharda

ABOVE 15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF SHARDA																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Intn Worm	GIT inf	Kidny inf	Fever	Total Diseases	Total Repeated (Total Rep/Total Patient)	Average Repeat (Total Rep/Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-35	3	2	0	0	1	0	0	1	1	0	1	6	1		0	0
2	Prof-36	4	4	1	0	2	4	0	1	2	0	3	17	4.75		0	0
3	Prof-38	13	6	4	0	2	3	0	0	5	3	9	32	3		1	0
4	Prof-39	11	8	2	2	4	4	0	0	4	1	8	33	2.75		2	0
5	Prof-40	2	0	0	0	1	0	0	0	1	0	0	2	7		0	0
6	Prof-41	8	5	0	0	0	1	0	0	3	2	4	15	2.66		0	0
7	Prof-42	12	10	2	0	3	4	1	2	7	6	9	44	3.4		6	0
8	Prof-43	8	7	4	2	2	2	3	0	4	3	7	34	4.28		0	0
9	Prof-44	3	0	0	0	1	0	0	0	0	1	1	3	0		0	0
10	Prof-45	5	2	0	1	1	1	0	0	1	1	5	12	4.6		0	0
11	Prof-46	5	2	2	0	0	0	0	1	2	1	2	10	15	65.53/20	1	0
12	Prof-47	4	4	4	0	4	4	0	0	2	1	4	23	4		2	0
13	Prof-48	6	4	0	0	4	4	0	0	5	1	4	22	3.6		0	0
14	Prof-49	4	0	0	0	1	1	1	0	0	1	1	5	1		0	4
15	Prof-50	4	3	0	0	2	1	0	0	0	0	2	8	1.66		0	0
16	Prof-51	3	0	0	0	0	0	0	0	1	0	0	1	1		0	3
17	Prof-52	3	0	0	0	0	0	0	0	0	0	0	0	0		0	3
18	Prof-53	4	0	0	0	0	0	0	0	0	0	0	0	0		0	4
19	Prof-54	4	2	2	1	2	2	1	3	1	0	2	16	3		0	0
20	Prof-55	11	9	7	1	1	4	0	0	8	6	8	44	2.83		2	2
Total		117	68	28	7	31	35	6	8	47	27	70	327	65.53	3.27	14	16
%Age of Disease			21%	9%	2%	9%	11%	2%	2%	14%	8%	21%	100%			12%	13.7%
%Age of Population)			58%	24%	6%	26%	30%	5%	7%	40%	23%	60%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 21: Type and Repetition of Diseases and use of boiled water in all age group of Autmuqam

TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF AUTMUQAM																
			DISEASE TYPES													
S.No	Proforma No#	Total Members	Diarr/& Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Ints Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated (Total Rep/Total Patient)	Average Repeated (Total Rep/Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-58	15	15	0	0	1	0	1	7	14	1	13	52	3.06		0	0
2	Prof-59	4	1	1	0	1	0	1	0	1	1	3	9	6.66		3	0
3	Prof-60	7	4	2	0	5	1	0	3	3	1	0	19	3.43		0	0
4	Prof-61	5	2	1	0	1	1	1	2	2	1	0	11	3		0	0
5	Prof-62	8	5	5	1	2	2	0	3	2	0	4	24	2.66		2	0
6	Prof-63	6	3	1	0	1	2	0	1	0	0	4	12	4.4		0	0
7	Prof-64	6	4	2	0	0	2	0	0	2	0	5	15	3.8		0	0
8	Prof-65	5	2	0	0	3	2	0	2	0	0	0	9	2.33		0	0
9	Prof-66	11	1	1	0	0	0	0	0	0	0	0	2	0		0	0
10	Prof-67	5	4	0	2	4	0	0	0	3	1	3	17	1.25		0	0
11	Prof-68	4	4	0	0	0	0	0	0	1	0	2	7	2	73.68/20	0	0
12	Prof-69	11	8	7	0	8	8	0	7	2	0	7	47	1.8		0	0
13	Prof-70	4	4	2	1	3	3	0	2	2	0	3	20	2.25		0	0
14	Prof-71	7	2	0	1	4	0	0	0	1	0	2	10	4.33		0	0
15	Prof-72	7	4	0	1	4	4	0	0	4	2	3	22	3.8		5	0
16	Prof-73	8	7	7	2	5	5	0	3	5	1	6	41	6.85		5	0
17	Prof-74	4	4	4	0	3	2	0	0	4	0	4	21	7		2	0
18	Prof-75	8	8	8	0	0	8	0	8	8	2	8	50	9.25		0	0
19	Prof-76	22	18	6	3	8	16	1	5	20	4	12	93	3.65		14	0
20	Prof-77	6	6	6	1	6	6	0	5	6	1	6	43	2.16		11	0
TOTAL		153	106	53	12	59	62	4	48	80	15	85	524	73.68	3.68	42	0
%Age of Disease			20%	10%	2%	11%	12%	1%	9%	15%	3%	16%	100%			27.5%	0%
%Age of Population)			69%	35%	8%	39%	41%	3%	31%	52%	10%	56%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 22: Type and Repetition of Diseases and use of boiled water in below 5 years of age of Autmuqam

BELOW 5 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF AUTMUQAM																
			DISEASE TYPES													
S.No	Proforma No#	Total Members	Diarr & Dysent.	Chl	Typh	Skin inf.	Eyes Inf.	Hep	Guts Worm	GIT Inf	Kidny inf.	Fever	Total Disease	Total Repeat(Total Rep/Total Patient)	Average Repeat# (Total Rep/Total Proforma)	Hospitalize (Yes/No)	Use of Boiling Water/Not Boiling Water
1	Prof-58	2	2	0	0	0	0	0	2	2	0	2	8	4.5			0
2	Prof-59	2	0	0	0	0	0	0	0	0	1	1	2	8		0	0
3	Prof-60	1	1	0	0	1	0	0	0	0	0	0	2	3		0	0
4	Prof-61	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
5	Prof-62	3	3	3	0	0	0	0	3	1	0	2	12	2.33		0	0
6	Prof-63	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
7	Prof-64	0	0	0	0	0	0	0	0	0	0	0	0	0			0
8	Prof-65	3	2	0	0	2	1	0	2	1	0	0	8	2.5		0	0
9	Prof-66	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-67	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-68	1	1	0	0	0	0	0	0	0	0	0	1	2	56.83/20	0	0
12	Prof-69	5	5	5	0	5	5	0	5	0	0	4	29	2		0	0
13	Prof-70	1	1	1	0	1	1	0	1	0	0	1	6	2		0	0
14	Prof-71	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
15	Prof-72	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
16	Prof-73	1	1	1	0	0	0	0	0	0	0	0	2	10		0	0
17	Prof-74	1	1	1	0	1	0	0	0	1	0	1	5	8		0	0
18	Prof-75	2	2	2	0	0	2	0	2	2	0	2	12	9		0	0
19	Prof-76	4	4	3	1	1	2	0	3	3	0	4	21	3.5		4	0
20	Prof-77	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
TOTAL		27	23	16	1	11	11	0	18	10	1	17	108	56.83	2.84	4	0
%Age of Disease			21%	15%	1%	10%	10%	0%	17%	9%	1%	16%	100%			15%	0%
%Age of Population)			85%	59%	4%	41%	41%	0%	67%	37%	4%	63%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 23: Type and Repetition of Diseases and use of boiled water in below 5-15 years of age of Autmuqam

5-15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF AUTMUQAM																
			DISEASE TYPES													
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes Inf	Hep	Ints Worm	GIT inf	Kidny Inf	Fever	Total Disease	Total Repeated(Total Rep/Total Patient)	Average Repeated (Total Rep/ Total Profarma)	Hospitalize (Yes/No)	Use of boiling Water/Non boiling Water
1	Prof-58	3	3	0	0	0	0	0	3	3	0	3	12	2.66		0	0
2	Prof-59	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
3	Prof-60	4	3	2	0	3	0	0	3	1	1	0	13	3		0	0
4	Prof-61	3	2	1	0	1	1	1	2	1	0	0	9	3.33		0	0
5	Prof-62	2	1	1	0	1	1	0	0	0	0	1	5	2		0	0
6	Prof-63	4	2	0	0	1	2	0	1	0	0	3	9	6		0	0
7	Prof-64	4	3	1	0	0	0	0	0	0	0	3	7	2.33		0	0
8	Prof-65	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
9	Prof-66	3	1	1	0	0	0	0	0	0	0	0	2	0		0	0
10	Prof-67	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
11	Prof-68	1	1	0	0	0	0	0	0	1	0	1	3	2	50.07/20	0	0
12	Prof-69	2	2	2	0	2	2	0	2	0	0	2	12	2		0	0
13	Prof-70	1	1	1	0	1	0	0	1	0	0	1	5	2		0	0
14	Prof-71	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
15	Prof-72	1	0	0	0	0	0	0	0	0	0	0	0	0		0	0
16	Prof-73	2	2	2	2	2	2	0	2	2	0	2	16	8.5		0	0
17	Prof-74	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
18	Prof-75	4	4	4	0	0	4	0	4	4	0	4	24	9.25		0	0
19	Prof-76	3	3	0	0	3	3	0	0	3	1	1	14	5		2	0
20	Prof-77	3	3	3	0	3	3	0	2	3	0	3	20	2		4	0
TOTAL		41	31	18	2	17	18	1	20	18	2	24	151	50.07	2.5	6	0
%Age of Disease			21%	12%	1%	11%	12%	1%	13%	12%	1%	16%	100%			15%	0%
%Age of Population)			76%	44%	5%	41%	44%	2%	49%	44%	5%	59%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 24: Type and Repetition of Diseases and use of boiled water in above 15 years of age of Autmuqam

ABOVE 15 YEARS TOTAL DISEASES, AND AVERAGE REPEATED DISEASE OF AUTMUQAM																	
			DISEASE TYPES														
S.No	Proforma No#	Total Members	Diarr & Dysent	Chl	Typh	Skin inf	Eyes inf	Hep	Ints Worm	GIT inf	Kidny inf	Fever	Total Disease	Total Repeated(Total Rep/Total Patient)	Average Repeat (Total Rep/ Total Proforma)	Hospitalize (Yes/No)	Use of boiling Water/No n boiling Water
1	Prof-58	10	10	0	0	1	0	1	2	9	1	8	32	2.9		0	0
2	Prof-59	2	1	1	0	1	0	0	0	1	0	2	6	6		3	0
3	Prof-60	2	0	0	0	1	1	0	0	2	0	0	4	4.5		0	0
4	Prof-61	2	0	0	0	0	0	0	0	1	1	0	2	2		0	0
5	Prof-62	3	1	1	1	1	1	0	0	1	0	1	7	2.5		2	0
6	Prof-63	2	1	1	0	0	0	0	0%	0	0	1	3	2		0	0
7	Prof-64	2	1	1	0	0	2	0	0	2	0	2	8	6		0	0
8	Prof-65	2	0	0	0	1	1	0	0	0	0	0	2	2		0	0
9	Prof-66	7	0	0	0	0	0	0	0	0	0	0	0	0		0	0
10	Prof-67	5	4	0	1	4	0	0	0	3	1	3	16	1.5		0	0
11	Prof-68	2	2	0	0	0	0	0	0	0	0	1	3	2	69.87/20	0	0
12	Prof-69	4	1	0	0	1	1	0	0	2	0	1	6	1.33		0	0
13	Prof-70	2	2	0	1	1	2	0	0	2	0	1	9	2.5		0	0
14	Prof-71	6	2	0	1	4	0	0	0	1	0	2	10	4.33		0	0
15	Prof-72	6	4	0	1	4	4	0	0	4	2	3	22	3.8		5	0
16	Prof-73	5	4	4	2	3	3	0	1	3	1	4	25	5.25		5	0
17	Prof-74	3	3	3	0	2	2	0	0	3	0	3	16	6.5		2	0
18	Prof-75	2	2	2	0	0	2	0	2	2	2	2	14	9.5		0	0
19	Prof-76	15	11	3	2	4	11	1	2	14	3	7	58	2.93		8	0
20	Prof-77	3	3	3	1	3	3	0	3	3	1	3	23	2.33		7	0
TOTAL		85	52	19	10	31	33	2	10	53	12	44	266	69.87	3.49	32	0
%Age of Disease			20%	7%	4%	12%	12%	1%	4%	20%	5%	17%	100%			37.65%	0%
%Age of Population)			61%	22%	12%	36%	39%	2%	12%	62%	14%	52%					

Abbreviation:

Diarr & Dysent= Diarrhoea and dysentery, Chl= Cholera, Typh= Typhoid, inf= Infection, Hep= Hepatitis, GIT= gastro Intestinal Track, Prof= Performa, Rep= Repeated

Table 2: Age Wise Total Consultations in Thehsil Headquarter Hospital Autmuqam

Age Wise Total Consultations from July 2007 to July 2009				
Diseases	**No of Cases < 5**	**% < 5**	**No of Cases > 5**	**% >5**
	0	0	0	0
AD	8494	16.13	14294	7.93
AJS	1	0	48	0.03
BD	415	0.79	1451	0.81
INJ	45	0.09	158	0.09
LRTI	7103	13.49	16514	9.16
MAL	21	0.04	107	0.06
MS	0	0	1	0
OTH	17506	33.24	94011	52.17
Chl	0	0	1	0
SCB	1645	3.12	10263	5.69
UF	490	0.93	2021	1.12
URTI	16941	32.17	41347	22.94

Abbreviation:
AD= Acute Diarrhoea, AJS= Acute Jaundice Syndrome, BD= Bloody Diarrhoea, INJ= Injuries, LRTI= Lower Respiratory Track Infection, MAL=Malaria, MS=Measles, OTH= Others, Chl=Cholera, SCB=Scabies, UF= unexplained Fever, UTRI= Upper Respiratory Track Infection

Table 1: Total Consultations in Thehsil Headquarter Hospital Autmuqam

Total Consultations from July 2007 to July 2009		
Diseases	**No of consultation**	**% of total consultation**
	0	0
AD	22778	9.79
AJS	49	0.02
BD	1866	0.8
INJ	203	0.09
LRTI	23617	10.15
MAL	128	0.06
MS	1	0
OTH	111378	47.86
Chl	1	0
SCB	11884	5.11
UF	2611	1.08
URTI	58288	25.05

Abbreviation:
AD= Acute Diarrhoea, AJS= Acute Jaundice Syndrome, BD= Bloody Diarrhoea, INJ= Injuries, LRTI= Lower Respiratory Track Infection, MAL=Malaria, MS=Measles, OTH= Others, Chl=Cholera, SCB=Scabies, UF= unexplained Fever, UTRI= Upper Respiratory Track Infection